Chemical Week

July 21, 1951

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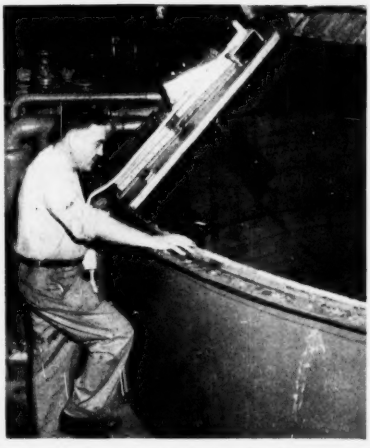

Synthetics put pressure on wool; Coming up: rough battle, hefty output ..... p. 11

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Rubber chemicals surge; reason: more synthetic, new formulations ..... p. 37

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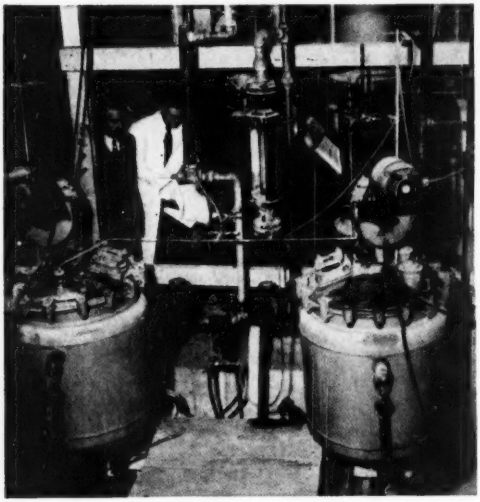

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Chemical Week

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OPINION . . . . .

Eyes-Open Folly

To The Editor: I agree with Chemical Week's recent statement that at Torquay the "United States took a step toward giving aid to some potential competitors in this country's domestic chemical market." In my opinion, however, the ultimate effects of this step may be much more serious than your statement portends.

It would seem that insofar as chemicals are concerned, Germany, for all practical purposes, got something for nothing at Torquay . . . not a grant in aid or a loan from the Federal government . . . but a gift in the form of domestic markets at the expense of an unwilling donor, the domestic chemical industry. Of course, because of the present emergency, it may take some time for the effects to be felt, but as more normal conditions return and . . . the market becomes more competitive, cheap German labor will inevitably take its toll.

It cannot be said that the State Department negotiated blindly at Torquay. It negotiated with its eyes wide open. The domestic industry took pains prior to the negotiations to point out that the German chemical industry is the oldest in the world . . . that, although largely destroyed in the last war, it now has facilities and capacities substantially greater than in 1939. This, coupled with the very important fact that wages in the German chemical industry range from 18 to 53 per cent of comparable labor in the United States, makes it almost a certainty that they can undersell us in our own market unless we are afforded reasonable protection.

Despite these warnings and despite our painful lesson of World War I (when the German organic chemical industry, upon which we were dependent, suddenly was no longer available), the State Department cut tariffs on coal tar intermediates (and other chemicals) almost the full 50 percent allowable. It may be doubted if even Cordell Hull, the father of trade agreements, would have sanctioned such drastic reductions. Hull himself has said that he "adhered to the principle of reduction of trade barriers gradually and cautiously." The Torquay reductions were neither gradual nor cautious.

Moreover, the drastic reductions cannot be justified seriously by pointing to any reciprocal reductions, and through them hope of increased exports. Most of the so-called concessions on chemical items made by Germany are not reductions in tariffs at all, but are agreements binding them at the present rate.

Furthermore, of the items listed, many (notably carbon black, boric acid and sodium borates) were listed by the NPA on June 20, 1951 as being in very short or tight supply in our own country. With such shortages we can hardly expect exports on these items to increase.

Unfortunately, the Administration not only is directing its attention to the domestic chemical industry in trade agreement negotiations, it also has singled the industry out for special attention in the Customs Simplification Act. As is well known, this proposed Act, although ostensibly introduced only for the laudable purpose of simplifying customs procedure, also sets out to reduce further the tariffs on dyes and other coal tar products by eliminating the "American Selling Price" as the basis for dutiable value.

Such a reduction, added to the Torquay reductions, would . . . go a long way toward putting the German industry back to its pre-World War I position of world dominance.

Perhaps the only ray of light in the tariff picture so far as the domestic chemical industry is concerned is the recent Trade Agreements Extension Act of 1951. The peril point provision and the escape clause provision of this Act are . . . great improvements.

Although the peril point provision will lose much of its effectiveness because . . . no major negotiations are contemplated during the next several years, the escape clause provision appears to be strong enough to afford some measure of relief to domestic industries adversely affected by tariff reductions.

C. R. Wagner
Vice President
General Aniline & Film Corp.
New York, N. Y.

For a trenchant analysis of what portends, CW's thanks to Reader Wagner. Our only wish: that more chemical executives would familiarize themselves with tariff affairs, be as thoughtful about their consequence, as alert to their probable impact—Ed.

Basic and Gabbro

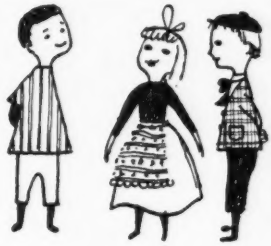
To The Editor: Your Opinion Column (July 7) has a letter from Mr. J. L. Scobie offering . . . misleading information on titanium and geology.

While 95% of the earth's outer crust (10 miles deep) may be igneous

A Bedtime Story for Very Junior Chemists

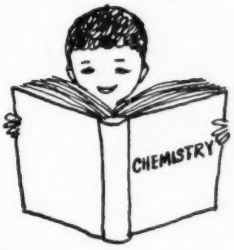
Once upon a time, there lived a sad little Sodium CarboxyMethylCellulose. He worked very hard extending Soaps and improving Synthetics. But all the Soaps called him a "war baby." And he wasn't allowed to associate with any but Low Grade Synthetic Detergents.

So he ran away. And arrived one day on the Doorstep of a Corporation in Wyandotte, Michigan. The Corporation picked him up and handed him over to the Research and Development Division. Well, you should see what they did for this little "war baby"!

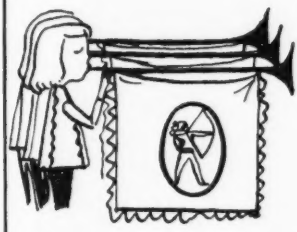


They changed his length and Molecular Structure. They Manufactured him by a brand new Process. They let him associate with High Grade Synthetic Detergents. And then they gave him a name . . . "Carbose*." *Reg. U. S. Pat. Off.

Carbose might have been very happy—but the Soaps still put on airs. "No matter how hard you and those Synthetics try," the Soaps told him, "nothing cleans as well as Soap."



But he worked hard just the same. He practiced Soil Removing and Whiteness Retaining and all the other things a detergency promoter should. And one great day, the Research and Development Division called the Soaps and Synthetics together and read a Proclamation:



"Synthetic Detergent products can be formulated with Carbose which will yield detergency equal to that of High Grade Soaps under conditions favorable to Soap, and far superior to High Grade Soaps under conditions unfavorable to Soap."

"Carbose!" Why, they were talking about him! Carbose was a hero! Yes, it was a great triumph for him . . . but Carbose went on . . . had a large family and did many more things . . . in textiles, paper, paints, ceramics, petroleum . . . and even in soap!

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OPINION . . . . . .

rock, 75% of the surface exposures are composed of sediments. No one is mining titanium ore at a depth of 1 mile let alone 10.

This outer crust is reportedly 99.5% composed of 13 elements, including titanium. The remaining 0.5% includes such common metals as copper, lead, zinc, tin, nickel, etc.

The problem is not so much the availability of ore as the processing into a pure metal. Titanite ($CaTiSiO_5$) —the silicate mineral of titanium —has not been found in quantities large enough to raise the question of commercial processing. . . . Hornblende is a complex silicate of calcium and magnesium with aluminum and iron. It is not "a prime source of titanium." Rutile and ilmenite may often occur in *conjunction* with but not part of hornblende. An example: the Piney River, Va. operation in a unique differentiate development of a gabbro magma. . . .

Hard rock titanium ores, such as the New York, Norway and Quebec ilmenite deposits are developments from basic magma. Granite has no business in the discussion, being relatively unimportant as a parent rock. . . .

R. P. Isaacs
Bayside, N. Y.

Some sound points, Reader Isaacs. However, Reader Scobie did not suggest that titanium was being mined at ten mile depth or that granite is a titanium ore. His was an evaluation of the elements in the earth's crust which (1) established Ti as the ninth most abundant (but not necessarily available) element (2) left one CW editor geology-groggy.—Ed.

Caution: Imine

To The Editor: . . . Please include me among the chemical readers who are grateful to Reader Conway for his well-written letter of caution about the insidious nature of ethylene imine.

It is not easy to dampen enthusiasm for "an extremely interesting and promising chemical" . . . but when a reader feels a professional obligation to call attention to its health hazard . . . he helps to make the chemical industry *healthier* . . . in more ways than one. . . .

W. J. Wiswesser
Willson Products, Inc.,
Reading, Pa.

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.
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melting point:	● 146 —148 C. (meniscus to complete melt)
appearance:	● White powder

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ESTERIFICATION

$(C_6H_5)_2CHCOOH + RCH_2Cl \xrightarrow{Na} (C_6H_5)_2CHCOOCH_2R + HCl$

Alkyl chloride — Alkyl diphenylacetate

HYDROGENATION

$(C_6H_5)_2CHCOOH + 6H_2 \xrightarrow{Catalyst} (C_6H_{11})_2CHCOOH$

Dicyclohexylacetic acid

BROMINATION

$(C_6H_5)_2CHCOOH + Br_2 \longrightarrow (C_6H_5)_2CBrCOOH + HBr$

α-bromo-diphenylacetic acid

CHLORINATION TO THE ACID CHLORINE

$(C_6H_5)_2CHCOOH + SOCl_2 \longrightarrow (C_6H_5)_2CHCOCl + SO_2 + HCl$

Thionyl chloride — Diphenylacetyl chloride

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NEWSLETTER

Prospects of peace in Korea have not perceptibly altered the chemical industry's long-term plans. Expanding civilian needs underlie the better part of new capacity; and day-to-day shifts in the military situation haven't affected preparation for preparedness.

In peace, the civilian economy absorbs ever-growing quantities of chemicals. The Defense Production Administration underscores this fact by implicitly assigning only half the value of new chemical plants to strictly military needs.

In war, those military needs breed new industries—and the current arsenal-economy is no exception. World War II put synthetic rubber and magnesium—to name but two—on sound commercial footing. And now defense authorities are encouraging, by rapid amortization and procurement practices, a $225 million synthetic fibers industry (see p. 11).

The spectacular rise of synthetic fibers is giving New England's backward-looking textile industry the jitters.

Chided for its stubborn resistance to change in a report just made to the President's Council of Economic Advisers, the Northeast's woolen industry stands to lose heaviest from the commercial advent of new fibers and the technological changes in their wake.

One way in which the Government may help New England: modification of laws relating to labeling of wool products. As it stands now, use of reworked or reprocessed wool must be admitted on the label; but no such requirement applies to reprocessed synthetics. Yankee textile men feel they are hampered by this discrepancy in the law.

Technological progress has opened up a big new field for polyethylene. Elmer E. Mills Corp., Chicago, is behind it.

Mills has succeeded in blowing polyethylene bottles of one gallon size. Injection-molded bottles are likely to come apart if they're dropped or if contents freeze; blown bottles pass these tests.

Sizeable markets are foreseen where breakage is dangerous, contents costly, or light weight yields a freight saving (a gallon glass bottle weighs 50 ounces, this one 14 ounces).

Already knocking on Mills' door: candy companies (flavoring extracts cost $25-$50 a gallon), photographic supply houses (contents are costly, polyethylene also cuts out ultraviolet light). Other products targeted for sales: acids, antifreezes, mercury.

More ammonia for fertilizer, more methanol: A $20 million expansion of Commercial Solvents' Sterlington, La., plant will double present capacity by early 1953, when completion is scheduled.

An ammonium nitrate unit will also be built to supply demand for solid fertilizer material.

Defense Production Administration is encouraging the project to the extent of a rapid write-off on 50% of the cost.

The Office of Price Stabilization is presently in a state of suspended animation. Until Congress decides how to control and how much, Stabilizer Di Salle's staff sees no point in issuing regulations that may last only a week or two.

Indecision over what final OPS responsibility will be also is slowing down the various industry advisory committees. Example: Members of the polyvinyl chloride IAC met last week to talk about a tailored price setup, but they decided not to make any recommendations until Congress tells OPS what power it will have during the coming twelve months.

Vinyl makers are now under the general ceiling price regulation and content to stay there. They're afraid that if they become subject to CPR-22, prices would be reshuffled—some forward, some back.

Sulfur users both here and abroad are now being squeezed from three directions. The International Materials Conference put allocation on a worldwide basis, granting U.S. and Canadian users 1,050,000 long tons per quarter. At the current U.S. production rate (1,300,000 tons), 250,000 tons would be available for export. At the same time, the Office of International Trade set a third-quarter export quota of 250,000 tons.

On the surface, then, neither action suggests a change in the domestic consumption pattern. But one producer says that IMC's action may be interpreted as placing a ceiling on U.S. consumption and channeling any excess overseas. (It is possible—even likely—that domestic output will exceed the 1,300,000-ton figure.)

In any event, NPA, through its sulfur order (M-69) still has the last word on domestic use.

Multimillion-dollar projects, site purchases and new products attest to continued growth of the industry:

Solvay Process Division will spend $13 million at Baton Rouge to increase by one-third its production of soda ash. The plant will be completed in about two years.

Barrett Division plans to build a $3½ million plant at Philadelphia to turn out 36 million pounds per year of phthalic anhydride. Application for a certificate of necessity has been filed, and completion of the facilities is expected in 1½ years. Barrett's 30-million-pound phthalic plant in Chicago is now under construction.

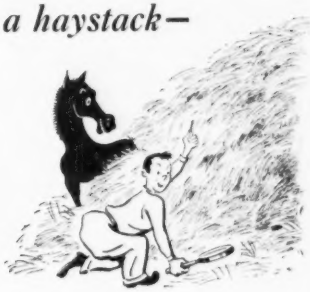
American Cyanamid has purchased a 1,600-acre tract at Deptford, near Savannah, Ga., for possible future expansion. Company officials are mum about whatever plans are proposed for the site.

It's likely that B. A.-Shawinigan, new subsidiary of British American Oil and Shawinigan Chemicals, will eventually produce surface-coating resins from phenol, acetone and epichlorohydrin (similar to Shell's Epon resins). The company will soon be making the first two chemicals, and the latter fits into its petrochemical pattern.

International Minerals & Chemical is upping output of betaine and the hydrochloride. IM&C has made these poultry feed additives on a small scale, but it has now made a large run at its Toledo plant. Betaine's biological activity resembles that of certain vitamins and amino acids like choline and methionine, promotes poultry growth.

Canadian Industries Ltd.'s sulfur dioxide liquefaction plant at Copper Cliff won't be in production for a year, but thereafter it should make sulfur dioxide a new chemical tool. Reason: Expected tank-car selling price is below $20 a ton f.o.b.—far under current quotations.

Choosing emulsifiers may be like hunting for a needle in a haystack—



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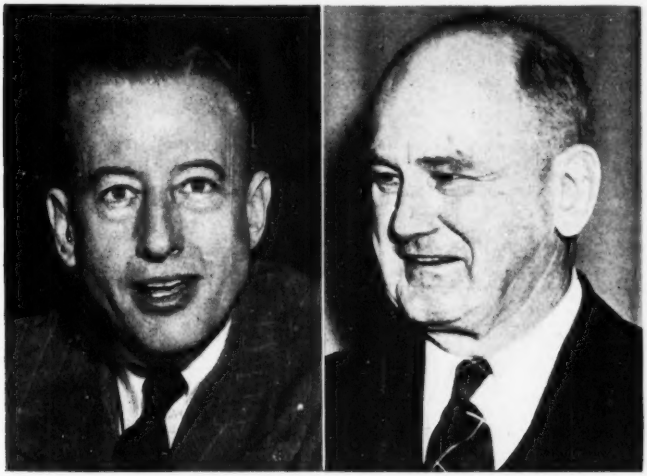
BUSINESS & INDUSTRY . . . . .



ESA's JOHNSTON and WOOL COUNCIL's DEVEREAUX: Who will laugh last?

Devereaux Johnston

~~Wool~~ vs. ~~Synthetics~~

Definite plans for the use of synthetic fibers in Armed Forces uniforms are revealed by E.S.A. Director Eric Johnston.

Army will use nylon-wool blend; Marine Corps announces Orlon- or Dacron-wool fabric; Navy testing rayon-nylon-wool.

Use of blends is blasted by H. J. Devereaux, president of American Wool Council.

The big battle over whether synthetic fibers can replace wool in clothing flared anew last week when Stabilization Director Eric Johnston revealed that the Department of Defense would, veer away from 100% wool standards in the future, order uniforms using a blend of 20% to 30% synthetics with wool.

Actually, predictions that synthetics would take over at least part of the wool market have been made in the textile field for years—but never by someone whose words carry the weight in national policy circles that Johnston's do.

Not being a textile man, Johnston probably didn't realize what a sore spot this was with wool growers. Just after his words were published, the president of the American Wool Council, Harry J. Devereaux*, took up the issue, somewhat rashly said, ". . . synthetic fibers . . . are so totally inferior to wool in essential qualities that there is no basis of comparison."

"Even the most optimistic producer of synthetic fibers," Devereaux went on, "will admit freely that to date no synthetic fiber has yet been produced which is comparable to wool in its exclusive qualities of protection, wear and service."

Reason for Synthetics: Johnston's announced reason for the use of synthetics was an economic one. American wool, which was selling at about $1 per pound before Korea jumped to almost $5, but since has gone below $3. It will probably drop to about $2.25 when the Australian clip arrives here.

No synthetic costs over $1.85, and even this figure, quoted on for pilot-scale Acrilan—may easily be lowered in larger production. Another decided advantage of synthetics is that prices are relatively stable and quality is constant. Both price and quality of wool fluctuate.

Johnston's statement that "it was necessary to find some means of halting the advance [of wool prices] . . . and this substitute, because it appears to be just as good as regular wool under supervised tests, should do the trick" brought a howl of anguish from legislators and pressure groups representing the 14 Western and Southwestern states where sheep-raising is big business.

The wool industry has received the protection of a 24½ cent/lb. tariff on apparel wool from Australia, source of about half of U.S. clothing wool supplies. An earlier attempt by Johnston to reduce wool prices by lowering this duty was snowed under by an avalanche of protests. On the other hand, wool growers in Australia are clamoring for a floor under wool prices to minimize their tariff disadvantage.

Fibers in Question: At present, the Army Quartermaster Corps has approved a nylon-worsted wool blend in serge, but this is not a 20-30% blend as Johnston's statement indicated.

The Army used to buy an 18-oz. all-wool serge, but now has just issued a call for 3,150,000 yards of 16-oz. serge containing 85% wool and 15% nylon. Reduction in weight per yard makes for a wool saving of 11.1%; an additional 15% economy by using nylon provides over-all wool saving of 24.4%.

Future Marine Corps procurement of woolen and worsted fabrics are to contain 15% Dacron or Orlon. The Corps has also suspended manufacture of tropical (wool) worsted uniforms for enlisted personnel.

The Navy is completing final tests on a 70% wool, 20% rayon and 10% Nylon fabric. Basic use for the fabric is in dress blues.

* Devereaux, a former newspaperman, owns and operates with his family a South Dakota ranch said to be one of the largest in the west. He is vice president of the Rapid City, S.D., National Bank.

New Navy winter clothing, now up for approval, contains only synthetic fibers. Only in uniforms and blankets is the service planning any future use of wool.

Talk in Washington points toward ultimate service use of acrylonitrile-based fibers—Du Pont's Orlon, Carbide's Dynel and possibly Chemstand's Acrilan—as well as Du Pont's terephthalate fiber, Dacron, and Virginia-Carolina's protein-based Vicara fiber.

Are Synthetics Better: The whole question of whether wool is better or worse than synthetics is one which defies a clear and concise answer. Contrary to some wishful thinking in the synthetic fibers industry, wool is not dead. It is a good and versatile fiber.

Wool's main advantage, from the standpoint of economics, is its relatively greater abundance. However, the NPA, through tax amortization, is encouraging erection of several new synthetic fiber plants to produce the equivalent of 225 million pounds of wool per year.

"This," Mobilization Director C. E. Wilson reports, "will go far towards reducing the world wool shortage and will make it easier to provide fabrics for our soldiers and civilians."

Thomas Serry, Navy clothing expert, this week told CW that the Navy no longer looks on synthetics as substitute fibers, despite the fact that the service turned to synthetics primarily because of the "prohibitive price" of wool. Synthetics fill Navy demands for an engineered fiber, he said, making possible fabrics which suit specific requirements much better than wool or other natural fibers.

He pointed out that wool growers in the U.S. no longer produce enough wool to meet requirements of the services. Wool therefore is a strategic imported commodity, not under this country's direct control.

Physical Properties: Wool is much more resilient than any acrylonitrile or polyamide fiber, though tests with Dacron indicate that this fiber may equal or surpass wool. Wool is absorbent—thus wool sweatshirts are worn by men in steel plants where moisture must be absorbed. In quick-dry fabrics where a low absorbency is wanted, advantage is with the synthetics.

Claims as to warmth and to the abrasion resistance—and thus, wear—of a fabric depend as much on variation in weaving details used as on the original fiber. (This is how wool can be used both for winter suiting and for tropical worsteds.)

Resistance to moths is a decided advantage of synthetics. Mothproofing wool adds to its already high price. While both wool and synthetics may shrink under certain conditions, a relatively simple heat stabilization process following weaving will eliminate shrinkage of synthetics.

The property of wrinkle resistance—while it does depend in part on fabric weave—is shown to a greater degree by synthetics and synthetic-containing blends.

Synthetics' Outlook: All in all, present outlook for synthetics in apparel goods is mainly towards use as wool extenders. Barring a desperate shortage of wool (as could be caused by the demands of an all-out war), blends will be the keynote of synthetics' use, at least in the next few years.

The need for fabrics will certainly not decrease, though synthetics will have to overcome mill inertia of the "wool was good enough in the past so why isn't it good enough now" variety. This is true even though in many cases synthetics are easier to spin and weave.

Unless wool prices fall to competitive levels, the stable-priced synthetics will have a good wedge in the door. The textile industry will produce those fabrics on which they can make the most profit. Also, consumer publicity on the exclusive properties of synthetics will help the demand for them.

But while the synthetic outlook is bright, it's not too probable that synthetics will do to wool what nylon did to silk. Not too many persons in the textile industry will echo the statement of Joe Golden, mens' wear fabric manager of synthetics-minded Burlington Mills.

When asked at a press conference last week concerning the introduction of a new line of synthetic suitings at what price wool would have to be offered to compete with synthetics, Mr. Golden said, "At no price."

FIBER	WOOL	ORLON	DYNEL	ACRILAN*	DACRON	VICARA
Price/lb. staple[1]	$2.80[2]	$1.70	$1.25	$1.85	$1.80	$1.00
Tensile strength (gms./denier)	1.0 to 1.7	4.0 to 5.0	3.0	3.0	4.4 to 6.6	1.1 to 1.2
Elongation	25 to 35%	16 to 21%	31%	18%	18 to 22%	30 to 35%
Elastic recovery	.99 at 2%	.97 at 2%	.97 at 2%	.80 at 2%	90-100 at 4%	.995 at 4%
Strength (psi)	20M-29M	59M-74M	50M	44M-66M	78M-116M	17M-19M
Stiffness (g/d)	3.9	24	9.7	30	23-63	2.8
Abrasion resistance	0.25	0.61	.46	.32	.49-.63	.18
Water absorbency	21.9% at 90RH	2% at 95RH	1% at 95RH		.5% at 95RH	64% at 90RH
Effect of heat	becomes harsh 100C decomposes at 130C	sticking point 235C	stick .137C	stick .235C	stick .240C	weakens 178C
Effect of age	little	little	little	little	little	slight
Effect of sun	weakened	very resist.	slight	slight	little	slight
Effect of acids (onc., room temp.)	resist.	resist.	resist.	resist.	resist.	resist.
Effect of alkalis (weak, room temp.)	susceptible	part. resist.	resist.	resist.	resist.	resist.
Effect of organic solv.	resist.	resist.	[4]	resist.	resist.	resist.
Dyeability[4]	good	development	easily	development	development	easily
Resist. to moths	none	wholly	wholly	wholly	wholly	high
Resist. to mildew	good	wholly	wholly	wholly	wholly	high

* First publication.
[1] Prices for synthetics in small-scale production may drop as production increases.
[2] U.S.D.A. average quotation, June 26.
[3] gms. cm. divided by denier cm.
[4] Special specific dyes for some synthetics now in development stage.
[5] Softened by ketones or 5% phenol.

Sorption Splitting

Sun Oil Co.'s new $8 million benzene plant at its Marcus Hook, Pa., refinery will soon be on stream. In this unit Sun's new Arosorb (from aromatic and adsorb) process* will go into commercial operation for the first time. Silica gel will adsorb the benzene and toluene content of the exit stream from the Houdriformer.

Adsorption from the liquid phase has long been employed to recover such varied but costly products as gold, streptomycin and iodine. Sun's new benzene plant marks the first application of liquid-phase (as opposed to vapor-phase) adsorption separation to low-cost hydrocarbons.

Nor is use of silica gel for hydrocarbon fractionation news; but its commercial application is. It was first employed in the middle '30s under the supervision of F. D. Rossini, then-director of an American Petroleum Institute project, for analysis of crude petroleum fractions. It provided a handy analytical tool for determining aromatic hydrocarbon content.

In Sun's new plant a 10,000-barrel-a-day Houdriformer will be followed up by an Arosorber to separate 13 million gallons of benzene and 30 million gallons of toluene a year. About 15 million gallons of xylenes will also be produced. The Houdriformer is Houdry Process Corp.'s catalytic reforming and dehydrogenating unit for production of aromatic

* Licensed by Houdry Process Corp., and Universal Oil Products Co.

F. D. ROSSINI: From an analytical method.

hydrocarbons from a naphthene feedstock.

Tons of Silica: The new plant will employ six silica gel cases, each containing 250 tons of a special grade of silica gel manufactured by Davison Chemical Corp. Each case will operate batchwise, but operating all six will provide continuous output of product.

The adsorption-desorpion cycle (100 minutes) is much the same as in chromatography. The hydrocarbon stream is passed over the silica gel, which adsorbs the aromatics. When the gel bed is nearly saturated the feed is shut off, desorption and elution of the aromatic hydrocarbons from the gel surface begins. First, the residual liquid in the gel case is displaced with butane. At this point, the aromatics mixture—50% xylenes and the rest benzene and toluene—is held on the gel surface. Washing with mixed xylenes frees the aromatics from the gel.

The desorbents are readily separated, both from the aromatic fraction and from the residual feed, by two distillation columns. Benzene and toluene are separated in a third column. Approximately two barrels of mixed xylenes and half a barrel of butane must be cycled per barrel of charge.

Pilot-plant studies indicate a gel life of at least a year. However, it must be protected from moisture and other poisons by pretreatment. A recovery of 90% yields 98% pure aromatics. If 90% purity is acceptable, recovery can be upped to 98%. A light sulfuric acid wash enables the product to meet the acid wash specification: very little olefinic material is adsorbed.

The cyclic action is automatically controlled by measurement of the refractive index.

Industry will watch Arosorb closely, to see whether liquid-phase adsorption is the best route yet to higher aromatics output. But the onlookers won't be confined to petroleum processors: The new technique may provide low-cost separation of many and varied mixtures of hitherto inseparable materials—and there's hardly a branch of the process industries that doesn't have that problem.

GOVERNMENT NEEDS

Bid Closing	Invitation No.	Quantity	Item
Navy Purchasing Office, 111 East 16th Street, New York City, N.Y.			
July 25	9208	20,000 lb	Calcium Hypochlorite
July 26	9225	54,000 lb	Ammonia—Agua
July 27	9232	46,000 lb	Bleach-Laundry
July 27	9216		Oxygen—Carbon Dioxide—Various Helium—Carbon Dioxide—and Oxygen mixture—Nitrogen—Monoxide—Oxygen—Nitrogen—Ethylene

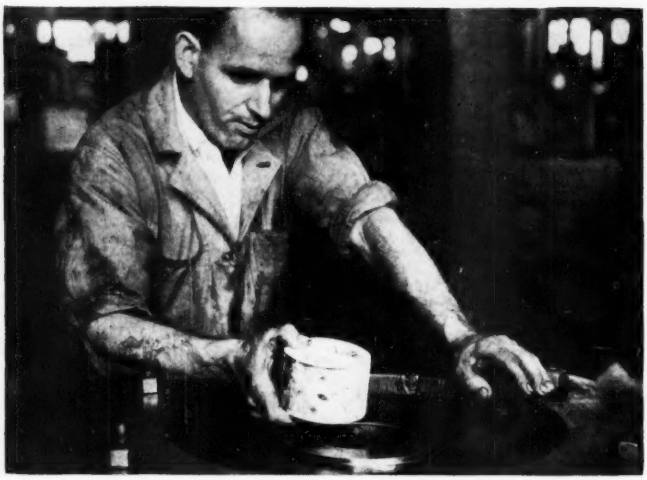
GOVERNMENT AWARDS

Item	Supplier	Location
Navy Department, Aviation Supply Office, Oxford Avenue and Martin's Mill Road, Philadelphia 11, Pa.		
Acetone	Douglas Chem. & Sup. Co.	North Kansas City, Mo.
Toluene	A. H. Thompson Co.	Berkeley, Calif.
Nylon: fabric coated, fire retardant, water-proofed.	U.S. Rubber Co.	Mishawaka, Ind.
Headquarters, Air Materiel Command, Wright-Patterson Air Force Base, Dayton, Ohio.		
Cleaning compound, cl-97.	Clayton Mfg. Co.	El Monte, Calif.
Carbon removal compound, cl-07.	Harley Soap Co.	Philadelphia, Pa.
	Clayton Mfg. Co.	El Monte, Calif.
Grease, insulating & sealing, cl-07	Dow Corning Corp.	Midland, Mich.
Navy Purchasing Office, New York, N.Y.		
Trichlorethylene, vapor-degreasing, technical grade.	Octagon Process Inc.	Staten Island, N.Y.
Trichloroethylene	E.I. du Pont de Nemours & Co., Inc.	Wilmington, Del.
Glycerin (Glycerol)	Cole Laboratories, Inc.	Long Island City, N.Y.
Armed Services Medical Procurement Agency, 84 Sands Street, Brooklyn, New York.		
Streptomycin	Chas. Pfizer & Co., Inc.	Brooklyn 6, N. Y.
Penicillin G. Crystalline Procaine Penicillin for Aqueous Injection Procaine Penicillin G for Aqueous Injection—Procaine Penicillin G. Crystalline in oil with Aluminum Monostearate.	Bristol Labs, Inc.	Syracuse, New York
	E. R. Squibb & Sons	New York, N.Y.

Item	Quantity	Value	Supplier
General Services Administration, 50 Whitehall Street, S.W., Atlanta, Georgia.			
Paints, varnish, etc.	6150 Gal	$22,837.40	Dixie Paint & Varnish Co., Brunswick, Ga.
General Services Administration, Federal Supply Service, Denver Federal Supply, Denver, Colo.			
Paints, removers and thinners	16 items	$24,060.54	Waggener Paint Co., Kansas City, Mo.
Paint, primer-sealer	5700 Gal	$10,509.00	20th Century Paint & Varnish Co., Brooklyn 11, New York
General Services Administration, Federal Supply Service, Denver Federal Center, Denver, Colo.			
Wax, floor, water emulsion	23,000 Gal	$17,070.00	National Chemical Research Labs, Chicago, Ill.

Current List of DPA-Certified Chemical Facilities

COMPANY	LOCATION OF FACILITIES	PRODUCT	AMOUNT ELIGIBLE	PERCENT
Humble Oil & Refining Co.	Baytown, Tex.	Toluene, xylene	$ 64,941	100
Narmco, Inc.	Costa Mesa, Calif.	Phenolic resins	63,493	75
Dow Chemical Co.	Freeport, Tex.	Methyl chloride	62,100	70
E. I. du Pont de Nemours & Co.	Louisville, Ky.	Neoprene	7,015,000	70
Commercial Solvents Corp.	Terre Haute, Ind.	Penicillin	746,370	65
E. I. du Pont de Nemours & Co.	Louisville, Ky.	Neoprene	401,000	70
Crown Central Petroleum Corp.	Pasadena, Tex.	Ethylene, propane, propylene	265,000	70
Borden Co.	Tacoma, Wash.	Resorcinol	490,000	75
Union Carbide & Carbon Corp.	Bishop, Calif.	Calcium tungstate	460,700	85



FOSCOAT PROCESS: A specialized sales group pinpoints a market.

Target: Metal Industry

Another step down the trail of sales specialization in the chemical process industries was taken last week with the creation by the Pennsylvania Salt Mfg. Co. of a new sales group to sell a specific set of new metalworking chemicals.

The chemicals, marketed under the name Fos Products, are used in cleaning, pickling and lubricating steel during different cold working processes. Key selling point: tight bonding of the lubricant to the metal, increasing production while reducing wear.

Heading the sales force will be Joseph J. Duffy, Jr., with Ralph Macon, Ernest Erickson and five sales trainees completing the group. In addition to supplying the necessary chemicals, the group will provide technical service for users of the integrated process.

The "Fos" in the name comes from the key chemical supplied—a zinc phosphate coating which can be applied to the steel by dipping, flooding or spraying. The coating—Foscoat is its trade name—is highly adsorbent to an organic lubricant known as Foslube. This not only is adsorbent but also chemically reacts with the phosphate, providing a highly bonded, heat-resistant surface for the metal.

Pre-cleaning is an important step in all cold working methods, not only in the Fos process, so chemicals available include pickling and special alkaline cleaners, designated as Fosclean products.

The Pennsalt metal industry sales group will handle such chemicals as the scale-removing chemical bath for the forging process (*CW, June 16*) in addition to this lubrication system for cold working of steel.

Joint Effort: Development of the Fos process was a joint project of Pennsalt and a fellow Philadelphia concern, the Heintz Manufacturing Company, metal processors. Immediately following the war, Heintz workers had been experimenting with a German steel extrusion process. They realized the need for a better lubrication process and developed the preliminary forms of the phosphate coating and lubricant.

At this point, Pennsalt was called in to integrate the discoveries into a complete line of market products.

Cooperative Clean-Up

Teamwork is paying off for residents of West Virginia's Kanawha Valley. Already they are benefitting from industry's independent efforts to cut down on air pollution. But bigger dividends will accrue from a cooperative program between industry and local governments which is currently entering the second phase: making recommendations for legislation.

Workers are scrambling this week to finish the first phase—sampling and analyzing the atmosphere. Started in January, the work was orginally slated to last for twelve months. A change in schedule caused the allotted time to be cut in half.

The next step will be compilation of the data and publication in about two months in a formal report. The report will form the basis of an accurate appraisal of the nature, source, and quantity of contaminants.

Indications: For years, the murky atmosphere and a high rate of respiratory trouble in the valley gave evidence of a pollution problem. Smogs have occurred but have been only an occasional nuisance.

It was the Donora tragedy which finally awakened the citizenry. As in many communities, a mild hysteria accompanied attempts to push through ill-advised legislation—without consulting industry. Later, more enlightened thinking led to formation of the Kanawha Valley Citizen's Anti-Air Pollution Committee. It is composed of 33 members appointed by mayors of six of the valley's cities.

The citizen's committee took a sound approach to the problem: It solicited—and got—the aid of the state Public Health Department and industry management.

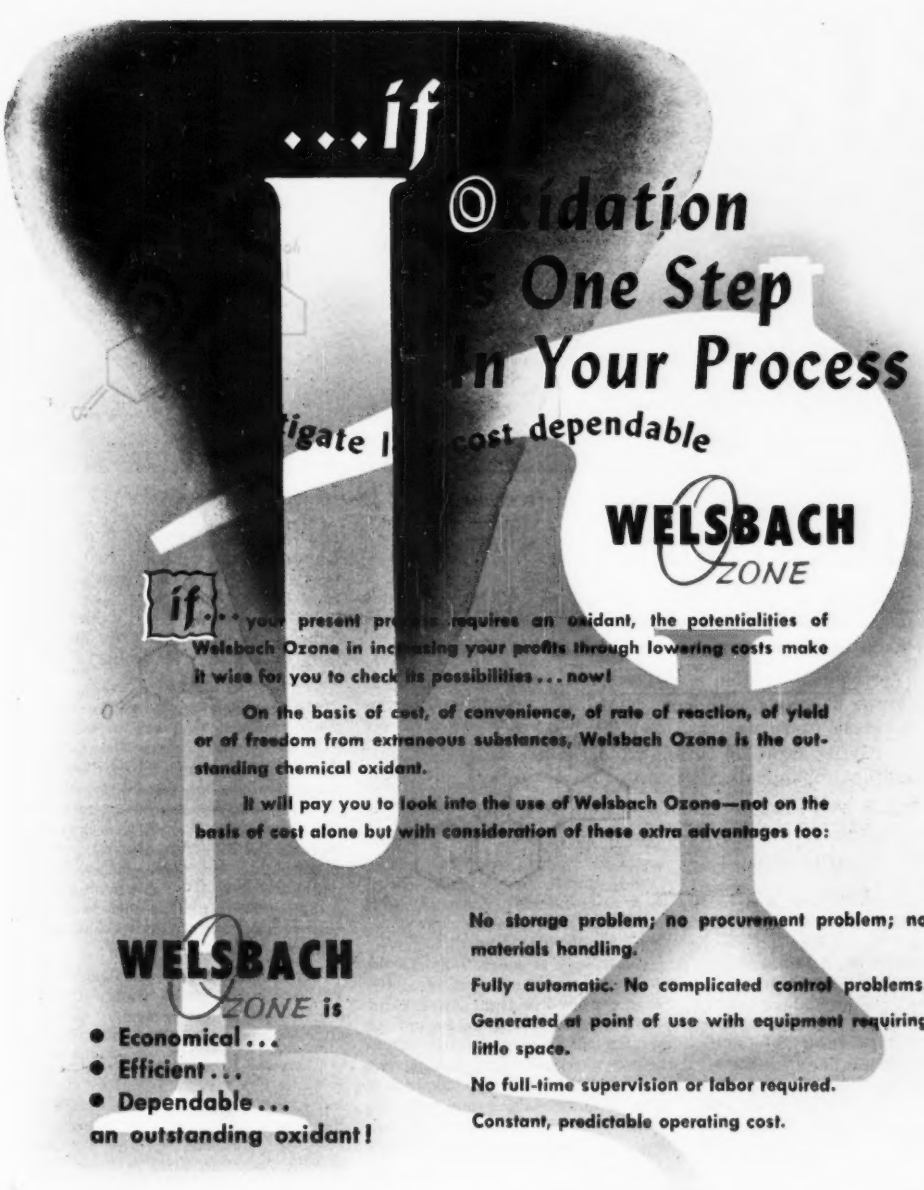
As a result, industry presented the committee with information on what steps it had taken and what was planned for the future. Most of the information came as a surprise to the general populace who were not aware that any positive action had been taken.

Trouble Spots: Chief source of pollution in the area is fly ash. Despite the high (90%) operating efficiencies of many of the dust collectors, the ash cannot be completely eliminated.

In addition, smaller quantities of such contaminants as coke dust, sulfur dioxide (from sulfuric acid production), hydrogen sulfide (from manufacture of carbon disulfide) and magnesium silicate contribute to the problem.

Remedies: Some of the steps taken by industry included replacement of coal-burning yard locomotives with diesels and hopperless steam engines; 50% reduction in sulfur dioxide fumes by improvements in sulfuric acid process (additional improvements are forthcoming); dust collectors have been installed to reduce the magnesium silicate pollution; and a new carbon bisulfide plant, now in development, gives promise of completely eliminating hydrogen sulfide as a source of trouble.

Teamwork: After a thorough study of needs, industry donated $25,000 to the committee for the sampling work which is now being completed. When the facts are available, progressive legislation will be adopted. For the residents of the valley, it all adds up to real headway in the fight against air pollution—but only after industry was put on the team.



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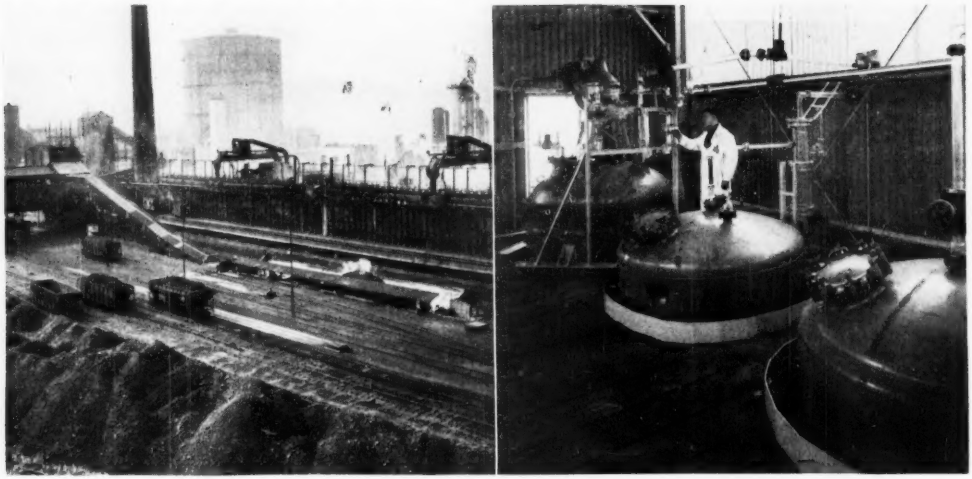

PITTSBURGH COKE & CHEMICAL CO.: Coke ovens to benzene hexachloride, all at Neville Island.

Vertical Pittsburgh

Completion of Pittsburgh Coke & Chemical Co.'s second parathion unit and pending construction of a third blast furnace highlight company's broad range of interests.

Vertical integration is the cornerstone underlying business structure. It starts with coal mining . . . then coking to supply its blast furnaces . . . includes coal tar refining, of course . . . carries right up through plasticizers, intermediates, and agricultural chemicals.

Next move is fine chemicals, and a further possibility is a joint venture into petrochemicals with its corporate cousin, Texas Gas Transmission Co.

Pig iron and plasticizers seem poles apart, but they—as well as Portland cement and insecticides—fit neatly into Pittsburgh Coke & Chemical Co.'s pattern of vertical integration.

P. C. & C. uses everything but the squeal from its pig iron production at Neville Island, Pa. (near Pittsburgh), where its main operations are located. Although P. C. & C. is medium-size, as chemical companies go, its top-level affiliation with a number of other raw material producers provides a sound basis for future growth.

Starts with Coal: First link in P. C. & C.'s product chain is coal, mined by an affiliate and transported from the mine to Neville Island by river barge. Here, after processing, the coal is charged to three coke batteries, totalling 105 ovens.

A major portion of the coke produced is used for the operation of the company's two blast furnaces, one on Neville Island, the other at Struthers (near Youngstown), Ohio. A third furnace of 850 tons/day capacity is slated for Neville Island.

The balance is sold as foundry coke to the foundry industry in the Pittsburgh district. The large quantities of coke produced by the steel plants in the Pittsburgh area hardly supply their own requirements, leaving the foundry industry largely dependent upon local bee-hive ovens and this one by-product coke producer.

Iron ore required by the company's blast furnaces is presently obtained from the Lake Superior district, which source will later be supplemented by ore from the new Labrador ore range.* The ore is moved by ore boats of the Great Lakes Steamship in which P. C. & C. owns a substantial interest. P. C. & C. now buys its limestone from other producers, although it owns a limestone mine with a very sizable reserve on the Allegheny river not far from the Pittsburgh area.

Pig iron from P. C. & C.'s Struthers furnace is moving to General Motors Corp. under a five-year contract which still has three years to run.

Slag for Cement: Even the blast-furnace slag doesn't escape integration. It is used by the Green Bag Cement Division as an ingredient in the production of several types of cement, including portland pozzolan cement of which P. C. & C. was until recently the only domestic producer. A portion of the Cement Division's production is used in turn by another division, the Neville Concrete Pipe Co., in manufacture of its building materials.

These activities are fundamental to Pittsburgh's integrated structure, but a great deal of the company's efforts are now being directed into chemicals.

Chemical Emergence: Historically, P. C. & C.'s Neville Island facilities started with a blast furnace built about the turn of the century by Carnegie Steel Co., and later operated by the present American Steel & Wire Co. This blast furnace formed the nucleus around which Davison Coke & Iron Co. built coke ovens and a cement plant about 1928.

The first step toward chemical production came with installation of light oil refining equipment and facilities for recovery, of by-product ammonium sulfate. After the depression of the early '30s, the company was reorganized in 1936 as the Pittsburgh Coke

* P. C. & C. formerly operated its own iron ore mines in Michigan, sold them a few years ago in order to concentrate on its Neville Island operations and expansion into chemical products.

& Iron Co., which name was later changed to reflect the greater emphasis that was being placed on chemicals.

The crude tar was originally sold to tar distillers. Next step in chemical development was refining the tar at Neville Island. Installation of a continuous Wilton tar still (first in the U.S.) led to the recovery of refined tar acids, tar bases, naphthalene, etc.

Although P. C. & C. relies primarily on its own raw materials, it has purchased some outside crudes in order to augment its production of refined products. For example, P. C. & C. purchases crude tar bases and has become the second largest producer (next to U.S. Steel) of refined pyridine and related tar bases. The company also refines considerably more naphthalene than is obtained from its own coke ovens.

A sulfuric acid plant was installed in 1940. Two years later a system for the recovery and separation of hydrogen cyanide and hydrogen sulfide from coke oven gas was placed in operation. This system, the first in this country to isolate pure hydrogen cyanide from coke oven gas, also provides hydrogen sulfide for the sulfur burners of the sulfuric acid plant.

Further integration was stymied by World War II, but military needs for activated carbon (gas masks) provided opportunity in another direction. The company had been at work on a process for making activated carbon from soft coal, and the product—cheaper and available in greater quantities than those in current use—was found suitable. P. C. & C. operated two carbon plants for the Government during the war, producing gas-mask carbon for most of the service requirements. Rebuilt and enlarged after a 1946 fire, its output is an important part of the company's diversified but coherent product line. Applications vary from catalyst support for vinyl chloride production to decolorization of corn sugars.

Synthetics: First step in chemical utilization of coal-tar products came in 1947, when the firm purchased from the Government a partially completed phthalic anhydride plant. Finished the following year with a capacity of 10 million pounds, it became the foundation for the company's later entry into plasticizer manufacture.*

Two other product lines were started in 1948. P. C. & C. latched on to the pipeline boom, began production of bituminous (hot-applied) pipe coatings. It also took its first step in the agricultural chemical field by producing the rodenticide ANTU (alpha-naphthylthiourea), and later the insecticide DNOC (dinitro-ortho-cresol). Emphasis was switched to production and formulation of 2,4-D (2,4-dichlorophenoxyacetic acid) and 2,4,5-T (2,4,5-trichlorophenoxyacetic acid) when these products proved to have greater growth potential.

P. C. & C. eventually built up its own sales organization operating as the Pittsburgh Agricultural Chemical Co., supplemented its manufactured products with purchased BHC (benzene hexachloride), DDT, chlordane, toxaphene, aldrin, Phygon, Spergon, and other compounds used in finished formulations. In 1950 P. C. & C. constructed its own BHC facilities to supply the increasing demand for that product. Ammonium sulfate, an important component of mixed fertilizers, is also available from the coal chemicals operation.

The formation of a Fine Chemicals Division is in the works, but to date there has been no indication of the type of products to be produced.

Organic Phosphates: Newest P. C. & C. plant is a second, just-completed parathion unit. A small, initial unit was completed in 1948, when it, along with those of American Cyanamid and Monsanto, went into production of this complex phosphate insecticide.

Last year P. C. & C. formed, with Geary Chemical Corp., the jointly-owned Chemagro Corp. in order to develop certain of the agricultural chemicals on which Geary has exclusive U.S. rights under a license from Farbenfabriken Bayer (Leverkusen, Germany). Under this arrangement, Pittsburgh will manufacture certain of these products for Chemagro, which will handle the marketing. The first new product to be developed under this arrangement will be Metacide—a recently announced insecticide similar to parathion but less toxic to humans.

Coatings, Plasticizers: The original pipeline coating plant—utilizing coke oven pitch as well as solvent oils—has been supplemented by a new plant put on stream in 1950. The advantageous location of the plant, near the coke ovens and at the edge of the Ohio River, permits P. C. & C. to retain its competitive position in the Southwest by virtue of low-cost barge shipments to river and Gulf Coast locations.

An expansion of this coatings line, now under way, includes the addition of cold-applied tar base coatings for corrosion protection of structural steel, water lines, tanks, etc. Supplementing these is a complete line of corrosion resistant coatings, including alkyds, chlorinated rubbers, vinyls, and phenolics.

Latest link in Pittsburgh's chain, introduced a year ago last month (*CI, June 1950, p. 817*), is plasticizers. Based primarily on its own phthalic anhydride and cresylic acid, these esters include phthalates and phosphates, as well as supplemental products such as adipates, sebacates, and tetrahydrofurfuryl oleate.

What Next?: Pittsburgh is by no means thinking of stopping where it is. The direction of the company's next move is anybody's guess, but a closer rapport between P. C. & C. and Texas Gas Transmission Co. one of its corporate kin, appeals to the logical-minded kibitzer. The former's chemical know-how and the latter's natural gas supplies are a combination that would bear a strong resemblance to the Mathieson-Tennessee Gas venture, (*CI, May 1950, p. 662*). P. C. & C.'s interest in coal reserves should also bring to their minds long-range planning directed towards coal gasification, hydrogenation, or even Fisher-Tropsch.

The new blast furnace capacity will likely require more coke ovens, which will add to P. C. & C.'s raw material base and inevitably permit further chemical expansion. Recently certificates of necessity have been granted covering a large part of the sizable planned expansion program.

Whatever the direction, it is a good bet that Pittsburgh will move. Its strong financial resources, and its demonstrated eagerness to take on new worlds, makes motion inevitable.

Rubber Price

The price of natural rubber is due for another slapdown. The powerful "preparedness" committee of the Senate, headed by Sen. Lyndon Johnson, and several administration officials last week put their weight behind the move to reduce the price of natural rubber still further.

Recently, General Services Administration, sole buyer and seller of natural rubber for the U.S., reduced the price on sales to domestic users. New price, effective July 1, is 52¢ per pound, a 14¢ drop from the level established last December.

Rubber experts believe the aim of the GSA and Rubber Reserve Corp., which produces synthetic rubber, is to knock the price of natural rubber back to the present price of synthetic which is now 24.5¢ a pound. But that is still a long way from 52¢.

* The phthalic plant is actually operated by the Empire Chemical Co., about 93%-owned by P. C. & C.

FOREIGN. . . . . .

Canada: A $75 million forestry operation is in prospect for the Arrow Lakes area of British Columbia where the B. C. Power Commission recently opened its 33,000 hp Whatshan power plant. It would include a chemical pulp mill, newsprint plant, sawmill and possibly a plywood plant.

Land Minister E. T. Kenney says the project has been planned for three years and that it is "coming quite soon." One report has it that Columbia Cellulose (affiliate of Celanese Corp.) has been studying the area and is the interested party in the proposed project. Power for the new industry would come from the Whatshan plant which can double its capacity at relatively small cost.

EXPANSION . . . .

Universal Oil Products: The company has joined the popular move to the country. A site has been purchased near Des Plaines, Ill. An office building will be erected first and on completion next spring, the staff will move from the Chicago offices to the new site. Labs will also be built to accommodate the entire research staff presently located in Lyons, Ill.

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Mineral Products Co.: Associated with Spencer Chemical, Mineral Products is building a plant, by fall expects to be producing a building block from ground mineral aggregate.

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Reynolds Metals: Capacity of the Longview reduction plant will be boosted from the present 65 million lbs. a year to 100 million lbs. by increasing the size of the pots on the three pot lines. Work will start shortly, should be completed next spring.

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AEC: A bidder will be selected soon to construct a new atomic energy research laboratory facility at Argonne National Lab (near Lamont, Ill.). Construction will begin 10 days after the contract has been let, completion scheduled within a year. Building will be 35,000 sq. ft. monolithic reinforced concrete. It will replace a heavy water experimental unit.

•

Air Reduction: About $1.5 million will be spent on re-equipping the dry ice plant taken over from Carbide and Carbon. The modernization program is part of the company's two-year, $30-million plans for expansion.

•

Vanadium Corp.: Company reports finding substantial additions to its high-grade uranium ore reserves in Colorado.

KEY CHANGES . .

Edward H. Frink: From assistant treasurer to secretary-treasurer, Sharp & Dohme.

Edward A. Barrett: To regional medical director, Professional Service Division, Armour Laboratories.

Samuel W. Levine: To director of development, Fisher Scientific Co.

Max A. Minnig: To board member, Witco Chemical Co.

William L. Scarborough: From manager acetate rayon plant, Waynesboro, Va. to director of acetate rayon production, Du Pont.

Andrew A. Smith: From manufacturing superintendent, Waynesboro plant, to plant manager, Waynesboro plant, Du Pont.

Henry C. Frehling: From assistant director of sales to director of rayon acetate sales, Du Pont.

W. D. R. Straughn: From manager technical service section to assistant director of sales for acetate rayon, Du Pont.

G. A. McLellan: From manager of wage and salary administration, American Airlines to manager of personnel administration, Mathieson Chemical Corp.

Paul L. Salzberg: From laboratory director, to assistant director, Du Pont Chemical Department.

David M. McQueen: To laboratory director, Du Pont Chemical Department.

Burt C. Pratt: To assistant laboratory director, Du Pont Chemical Department.

Clement W. Theobald: To research supervisor, Du Pont Chemical Dept.

A. J. Smith: From manufacturing superintendent of the nylon plant, Seaford, Del. to assistant director of sales for Dacron polyester fiber, Du Pont.

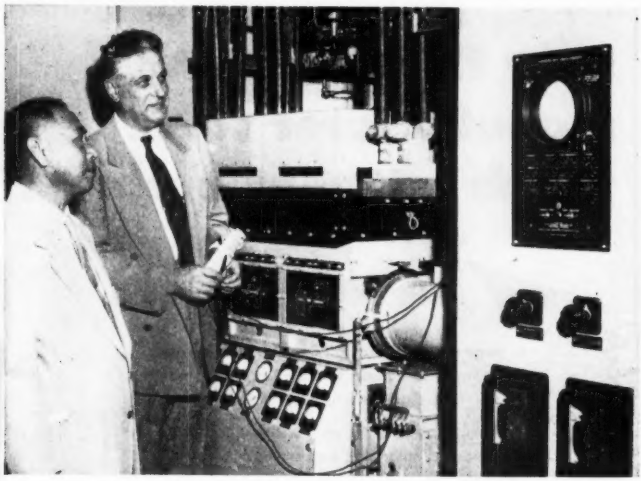
Robert W. Schramm: From market analyst, industrial chemicals, to manager, market research section, Spencer Chemical.

W. W. Bell: To vice president, S. B. Penick.

W. G. Bywater: To vice president, S. B. Penick.

Giles St. Clair: To secretary, S. B. Penick.

William A. Sredenschek: From assistant to the vice president for purchasing and traffic, to manager of materials and purchasing, General Electric.



CONTACT RECTIFIER: Test results please Superior's Felizardo and I-T-E's Jansen.

Low Voltage—Little Loss

New mechanical rectifiers deliver higher efficiency than present types at low voltages with no increase in installed cost.

Future: probable displacement of electronic and rotating converters by contact rectifiers at voltages up to 400 v.

Electrochemical industry's particular needs form basis for design in the development of the new rectifying equipment.

Electrochemical eyes are turned on the Philippines where the Islands' first mechanical contact rectifier will soon go into operation at Superior Gas and Equipment Co. of Manila's six-ton-a-day chlorine plant. Built by I-T-E Circuit Breaker Co., Philadelphia, the new unit in the $700,000 plant has a rating of 12,000 amperes and delivers 65 volts dc. Big selling point: high efficiency at low voltages.

Since most electrochemical operations have only a small voltage drop through the cell, small operators have been at a major disadvantage because of the low efficiency of present types of converters when operated at the low voltages necessary. Contact rectifiers, operating with high (90%) efficiency at voltages as low as 50 v, are finding more and more use in the industry.

The new rectifiers, now sold in this country by I-T-E and in Europe by Brown Boveri (Switzerland), first attempted to answer the electrochemical industry's need for large dc currents in the low voltage range with the Siemens-Schuckert "kontaktumformer" of 1940. By the end of the war initial operating wrinkles were ironed out, and 111,000 amperes were being produced in several large installations.

First installation in this country by I-T-E, at Buffalo Electrochemical Co.'s Buffalo plant, presumably for hydrogen peroxide, has proved so successful the company has reordered for its new Vancouver, Wash., plant. Since commencing sales in 1948, I-T-E has sold machines totalling 145,700 amps., and many more are on order.

Well known drawback of present electronic converters is considerable voltage drop due to arcing when contact is broken, necessitating high operating voltages to obtain high efficiency. With electric power constituting as high as 20%-30% of electrochemical production costs, operators have been forced to use voltages as high as 850 v to keep losses in dc-producing equipment at a reasonable level.

Problem: A rectifier having a higher efficiency than present types at voltages below 400 v was the need. Operating at over 96% efficiency at 400 v, about 6% higher than present converters, contact rectifiers seem to be the answer. While present electronic converters and rotating converters drop sharply in efficiency below 250 v—running barely over 80% at 100 v—contact rectifiers remain at over 90% down to 50 v. Thus, overall efficiency of contact rectifiers decreases only slightly between 400 v and 50 v. Reason: No constant voltage drop is involved as at the brushes of motor generators or in the arc of electronic converters.

In place of an electronic tube, the new rectifiers employ contacts operated by synchronous-motor-driven contact gear. With no arcing to produce losses, the efficiency of these installations, especially with low dc voltages, is higher than with other classes of converters. In the past, contact rectifiers have been out because the contacts would always have to be opened precisely at the passage through the zero of the contact current. Since this is impossible in practice, and to simplify conditions for the breaking operation, in the new rectifiers the circuit has been so modified that the moment of near-zero current is left stable at a low value for a period of time. During this low-current period the contact can be operated at practically off-load without arcing.

DC voltage of the contact rectifier can be regulated in a manner similar to that of a mercury-arc electronic converter. For installations required for various voltages, the main transformer can be equipped with an off-load tap changing switch, or with on-load tap changing gear for coarse regulation. Current delivered by the contact rectifier can be kept constant by an automatic current regulator.

Additional Dividend: Low weight of machine for same rated output and voltage requires no heavy foundations. Space needs are smaller, and buildings of light construction with less floor space and reduced height can be used. The machine can be installed close to the electrolytic cells, making an appreciable saving on cabling or bus-work. Small operators, like Superior Gas and Equipment Co., are particularly aided by this additional advantage.

I-T-E spokesmen say cost of installed contact rectifiers will be no more at all loads, than of present types. Coupled with the increased efficiency resulting in far lower power

losses, and the obvious physical merits of the equipment, this makes the new machines of great advantage, particularly where low voltages are desired.

In Brown Boveri's eyes, the extremely high efficiency of the contact rectifier, remaining practically constant between no-load and full-load, will probably result in its supplanting both the high current electronic converter and the motor-generator in plants requiring dc voltage up to 400 v.

Fluid Cat Reform

Hydroformer catalysts have gone fluid. Three plants* are now being engineered by M. W. Kellogg Co. who developed the process in conjunction with Standard Oil Co. (Ind.) and the Standard Oil Development Co. They feel they have an answer to the various other catalytic reforming processes that have mushroomed over the last few months.

Kellogg estimates that daily operating costs of the new system will be 30% lower than for present fixed bed hydroformers and the initial cost will be one-third less. Also the yields will be from 3-5% higher than for the fixed bed units.

Operation of the new type of hydroformer is akin to that of the fluid catalytic cracking units. The catalyst is maintained in a fluidized bed in the reactor and vaporized virgin naphtha passed through the bed. Cyclones at the top of the reactor remove entrained catalyst from the reformed hydrocarbon vapor which is condensed and then distilled. After regeneration the catalyst is recycled to reform more naphtha.

The product is high in aromatic hydrocarbons and could well serve as the feed for a benzene production plant.

Interesting note: The bottoms from the main fractionating tower just after the reactor are extremely high in naphthalene.

Sans Pulsation

Damage to pipe lines from pulsations in line pressures, caused by water hammer, is almost eliminated by the new desurger, built by Valve Engineering & Development Co. In this device, a section of the pipe is surrounded by a sleeve of pipe of a larger size. The inner pipe is pierced by a number of holes and covered by a Hycar rubber sleeve, which is held between the two pipes.

The holes serve as throttling orifices. When pressure increases a portion of the liquid carried in the pipeline goes out through the orifices, expands the Hycar sleeve into the chamber between the two pipes. When pressure decreases, the rubber contracts, pushes the liquid back into the line.

In one installation, to dampen pulsation of flow of an oil well drilling mud pump, the pump engine's rpm was smoothed to 2100-2200 from a previous variation of 1800-2400. Pressure pulsations dropped from 950-2250 psi to 1850-1900 psi.

•

Hot Screens: While screening moist products, hot screens increase the throughput of a given screen as much as 50%. Developed by F. R. Hannon & Sons, the heat is provided by the resistance of the wire screen to a low-voltage electrical current. "Blinding" of the screen is greatly reduced and "beating" to keep the screen open is eliminated.

•

Teflon-Coated Stirrer: Laboratory Industries, Inc. is producing a new magnetic stirrer for the laboratory, which is resistant to the action of all acids and alkalis. The corrosion resistance is supplied by the Teflon coating on the metal stirring bar.

•

Explosion-Resistant Glass: Pittsburgh Plate Glass Co. has developed a new laminated glass window to cut down the dangers of flying glass in case of explosion. The new glass has one outer layer of glass and an inner layer of polyvinyl butyral. The other outer layer consists of four fitted triangular pieces of glass. The plastic extends beyond the glass and is attached to the window frame.

When an explosion occurs the glass pane breaks into four triangular sections which turn on the "hinge" of plastic. After the explosion the four segments can again be moved into place and held together with adhesive tape, chewing gum or any handy material until the pane can be replaced.

•

Automatic Titrator: Fully automatic titration is made possible by a new titrator, which is being produced by Coleman Instruments, Inc. The liquid to be added is delivered rapidly until the end point is reached. Flow is then restricted and the final portions are added in progressively smaller increments. Progress of the titration is indicated by a pH meter.

* Pan-American Southern Corp., Destrehan, La. (2000 bbls./day; Cities Service Oil Co., E. Chicago, Ill. (10,000 bbls./day) and Lake Charles, La. (20,000 bbls./day).

PROBLEM...

...to help foundries speed up the production of castings for critical defense and civilian needs.

SOLUTION...

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Resin Chemistry Sets

RESULT...

...Foundry sands that are more quickly and accurately formed into molds, and produce sounder, truer castings that require less finishing. Cleaning time has been cut as much as 50% with Truline-bonded cores because they burn out quickly, collapse easily, and shake out fast. Foundries everywhere today benefit from the higher production speeds and greater economy of Truline Binder and NVX.

Other Hercules developments in resin chemistry are helping to set the production pace in many industries. For example, Vinsol® Resin—as the air-entraining agent in Portland cement—produces more durable highways, bridges, airport runways. This readily available material also alleviates materials shortages and improves performance for adhesives, plastics, paper. Hercules welcomes the opportunity of placing its long experience in resin chemistry at your disposal.

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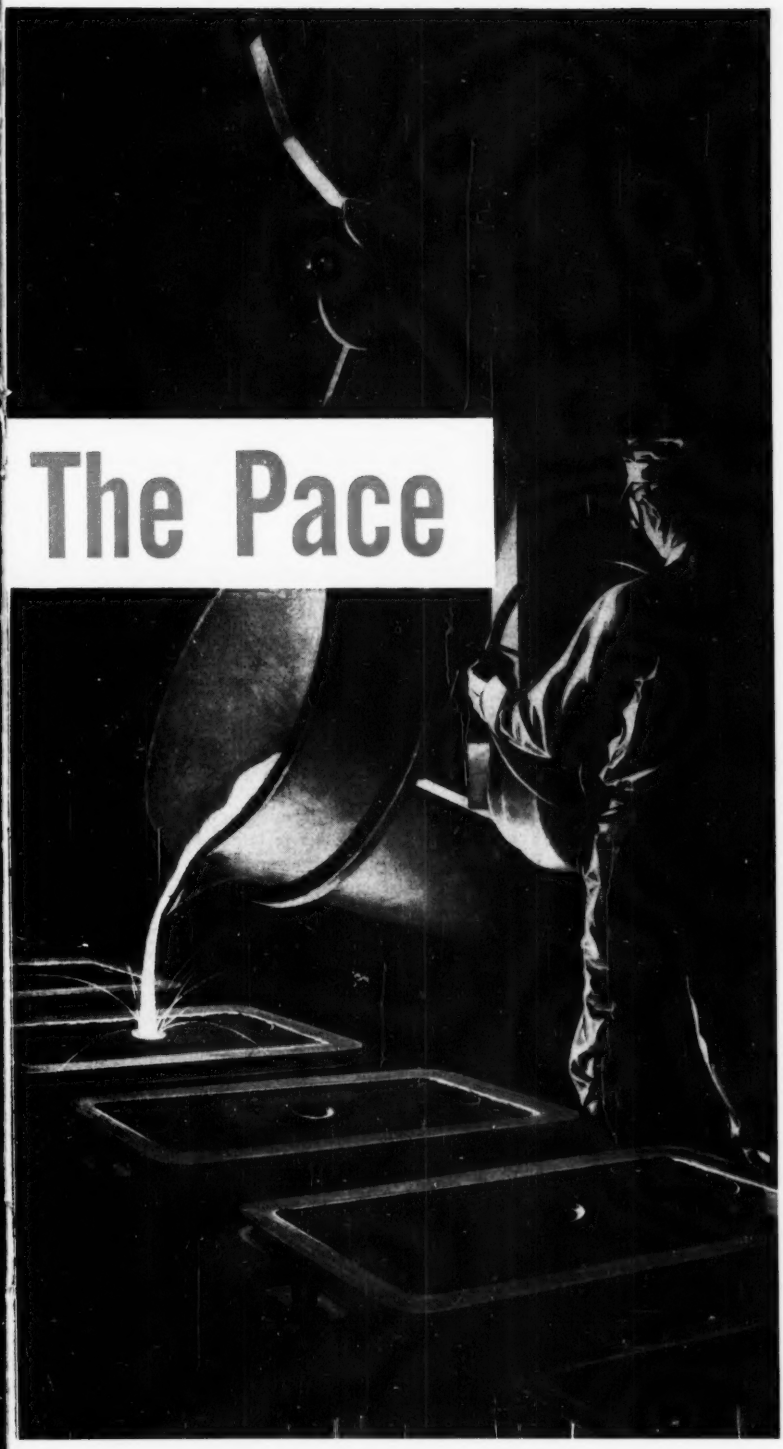

Let Lacquer Do It

A new Hercules leaflet, "Some Facts You Should Know About Lacquer," gives reasons for the ready availability and usefulness of lacquer today.

The leaflet points out that nitrocellulose lacquer is the least vulnerable to shortages of all production-line finishes today. Basically, the reasons for its availability are: ample production capacity for both nitrocellulose and lacquers to take care of military and essential civilian demands; lacquer formulations that are so flexible that lacquer is not tied to any one critical material, or to any group of materials.

The use of the hot-spray process is also recommended, wherever possible, in order to conserve solvents as well as to save production manhours.

Modern lacquer formulations, hot or cold, will be considered for military applications even where synthetic enamels are now specified because of the better availability of lacquers and the possible advantages obtainable by hot-spray, according to the leaflet, which also lists a number of military uses for which lacquer is now specified.

Non Phthalate Plasticizer

Phthalic anhydride shortages need no longer mean plasticizer shortages for manufacturers of vinyl goods. Commercial production of Hercoflex® 600, the new non-phthalate primary plasticizer for vinyl chloride polymers and copolymers, has just been begun after over three years of customer evaluation. Although initial production remains limited until expanded facilities are available, this new monomeric plasticizer provides, for the first time, a product competitive in price and performance with conventional phthalates but based on noncritical raw materials. Hercoflex 600 offers excellent heat and light stability, exceptionally low volatility, and good low temperature properties and plasticizing efficiency. Samples and literature will be supplied on request.

New Resin Dispersion

Hercules Dresinol® 155, a new nonsolvent-type, high-melting resin dispersion, is now available in commercial quantities.

This new resin dispersion can be used as a modifier and extender for synthetic or natural rubber latices in adhesives, supported films, and binders of all types. It is completely compatible with all types of latices.

GC51-4

It's time we got *working* mad!

As we listen to the latest insults from Moscow, we're likely to get fighting mad.

Instead, we'd better use our heads and get *working* mad.

It is clear by now that Stalin and his gang respect just one thing—strength. Behind the Iron Curtain they've been building a huge fighting machine while we were reducing ours. Now we must rebuild our defenses—*fast.*

As things stand today, there is just *one* way to prevent World War III. That is to re-arm—to become strong—and to stay that way!

This calls for better productivity all along the line. Not just in making guns, tanks and planes, but in turning out civilian goods, too.

Arms must come first. But we must produce arms *at the same time* we produce civilian goods.

We can do this double job if we all work together to turn out more for every hour we work—if we use our ingenuity to step up productivity.

All of us must now make sacrifices for the common good. But we're working for the biggest reward of all —*peace with freedom!*

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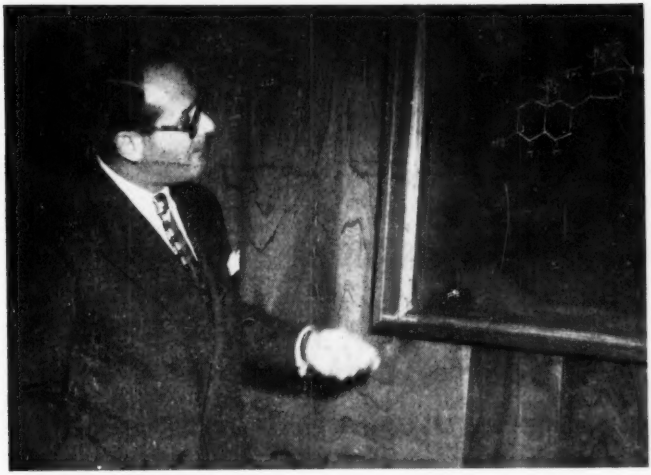


GEORGE ROSENKRANZ: A Mexican yam and 22 steps add up to a. . .

Big Boost For Cortisone

New synthesis from a relatively abundant vegetable source promises to crack the cortisone bottleneck.

Syntex, Inc., Mexico City, pioneered the development, hopes to be in production by early next year.

Availability of critical equipment is one question mark in the company's plans for early production.

Cortisone is again in the news, but this time the chemist—not the clinician—put it there. Researchers of Syntex S.A., prominent synthetic hormone manufacturer, have succeeded in their quest for a practical synthesis of the scarce drug from a plentiful raw material. A highly significant development, the new synthesis is not entirely unexpected.

From the day Merck & Co. came out with the first commercially feasible cortisone process, steroid chemists have probed the possibility of upping output by working out a synthesis based on a readily available raw material. Merck makes cortisone from desoxycholic acid extracted from animal bile. It takes several hundred steers to supply enough bile for a few grams of cortisone; moreover a 37 step synthesis is required to convert the bile acid to the final product.

Cortisone demand has skyrocketed, but supply—shackled by these production handicaps—cannot keep pace. Merck & Co., flooded with orders for the wonder drug, is now building a new plant. But, in view of the limited animal resources and obvious process drawbacks, it seems unlikely that even sizable new facilities can satiate the market.

New Source Needed: What is needed is a way to get cortisone from a more plentiful raw material. The need hasn't been ignored. Researchers have attacked the problem from every angle, with encouraging results. This May, Harvard's Robert B. Woodward made chemical history by the first total synthesis of a true steroid. Woodward's steroid, built-up from industrially available o-toluidine, isn't too far from cortisone.

Although Woodward's total steroid synthesis (from a common organic chemical) represents the most dramatic approach to the cortisone problem, other results now appear to have greater short-term significance. Recently, Fieser, Herz, and Huang, again at Harvard, succeeded in overcoming one of the major obstacles to the synthesis of cortisone from abundant natural materials.

They devised a technique for introducing an 11-keto group into a steroid lacking functional groups at positions 9, 11, and 12. Cholesterol, ergosterol, and diosgenin are relatively abundant compounds of this type. In fact the job was done by oxidizing compounds readily obtained from these plentiful steroids. A group of Merck researchers, headed up by Max Tishler, has achieved the same end, but by a slightly different process.

Mexican Success: Now, word comes from south of the border that the goal has been reached by a group of Syntex S.A. chemists. Under the able direction of George Rosenkranz and Carl Djerassi they parlayed a tropical yam, called Cabeza de Negra, and two years of hard work into a potential bonanza—a commercial process for vegetable-derived cortisone.

By the Syntex process, diosgenin from the yam root is converted to 11-keto-allo-pregnanolone. This transformation parallels the work of Fieser and associates, but according to Syntex, proceeds by a simpler route. Next, the Mexican researchers set a precedent of their own by changing 11-keto-allo-pregnanolone to Reichstein's Compound D. In the final stage, Compound D was worked up to cortisone in three steps.

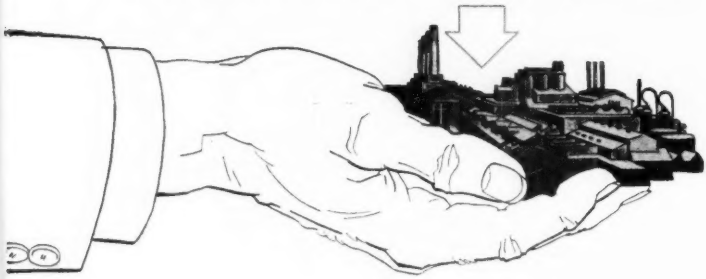
The complete synthesis involves 22 steps, has already proved itself in the laboratory; construction is now under way on a plant. Syntex anticipates little difficulty in converting to commercial production. Most operations are already being used in production of their other hormones. Several new steps will have to be perfected, but none is expected to cause sleepless nights.

If all goes well, Syntex should be in by early next year. Its path isn't altogether smooth, however. Certain vital equipment will have to come from the U.S.; shortages could throw a monkey wrench into some well laid plans. But Syntex apparently has seen its way clear to sink a proposed $2 million preliminary investment into its plans.

Within 3 years the company expects to produce cortisone enough to supply the entire U.S. demand. Already plant resources are being expanded on new plantations. In addition, new botanical laboratories and dehydrating facilities are being rushed to completion. A new extraction plant in Mexico City is now operating with a capacity of more than 500 tons of yam roots per month and the Syntex factory can now handle 40 tons a month of the pure root extract.

This small investment . . .

can save you thousands of dollars worth of hard-to-replace equipment and property



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Color Probe

RESEARCHERS at the U.S. Department of Agriculture's Western Regional Research Laboratory (Albany, Cal.) are trying to work out methods of determining how much natural color is retained after processing and storing of foods; also the extent to which food color is related to other properties. Here Marvel-Dare Nutting and Harold C. Lukens give dehydrated carrots the once-over with a photoelectric colorimeter.

Plastic Heating

Plastic tubing may find uses in radiant heating installations if research by the Bjorksten Research Laboratories, Inc., of Madison, Wis., is successful.

It is in the midst of a program testing the feasability of substituting plastics as possible substitutes for scarce metal piping. Plastics tested were vinylidene chloride, vinyl chloride co-polymer and polyethylene.

Hot water was circulated through tubing with ½" I.D. set in concrete. Tubes were 6" apart and 2" below the concrete surface. Despite what is described as a severe winter, water temperature never had to be raised above 135 F to maintain adequate room temperature.

From last winter's tests, Bjorksten has found that the advantages of plastic over metal seem to be these: freedom from corrosion, and lower initial and installation costs. Next winter's testing will include a thorough check of the relative heating efficiency of the various plastics in comparison with metal pipes.

Following completion of the tests in another year or two, the floor will be torn up and the condition of the pipes checked.

Curare Agent: Lederle Laboratories Div. of American Cyanamid Co. has come up with Flaxedil, a new curare-like muscle relaxing drug. Chemically tri-(diethylaminoethoxy) benzene triethyliodide, the drug is reported to be easier to administer and safer than natural curare.

•

Fungicidal Paints: Researchers at the Army Engineer Research and Development Laboratories, Fort Belvoir, Va., are working on the development of a number of fungicidal paints as part of a protective coatings study. ERDL engineers say any paint can be made fungus-resistant by the addition of a suitable fungicide. To date, treatment with copper 8-quinolinolate has been most effective.

•

Fungicidal Fumigation: Researchers at Air Force School of Aviation Medicine, Randolph Field, Tex., report simple, effective procedure for sterilizing shoes of athlete's foot sufferers. The method makes use of a commercial mixture of 1 part ethylene oxide to 9 parts carbon dioxide.

•

Color Research: Warwick Chemical Div. of Sun Chemical Corp. has opened a new laboratory devoted to problems of color chemistry relating to decorative printing of textile and plastics. New facilities represent a merger of several smaller labs, will be known as Suntone Colors laboratory.

•

Chromatography Speeder: New analytical procedure, for studying metabolic products resulting from the administration of C^{14} labeled compounds, utilizes a beta-ray densitometer. The method provides information in 18 minutes that ordinarily requires 15 days of exposure on X-ray film.

A paper chromatogram of tracer-containing substances is uniformly drawn (in exact conformity to recorder chart motion) across a fine lead slit in front of an ionization chamber. Output of the chamber drives the recorder pen.

•

Hormone Note: New testosterone synthesis, developed at the University of Washington, appears to have a commercial future. Starting material, androsten-3,17-dione is relatively abundant; yields are good.

•

New Insecticides: Workers at Purdue Research Foundation have shown two tolyl propane derivatives to be effective against common insect pests. Patents (U.S. 2,538,687; 2,538,724).

RESEARCH . . . . . .

TPN Available: Triphosphopyridine nucleotide is now available from Sigma Chemical Co. Commercial source will facilitate biochemical investigations requiring this hard-to-prepare material. Purity will be about 65% minimum, but preliminary reports indicate assays as high as 95%.

•

New Estrogen: French researchers report α,β-bis-(p-hydroxyphenyl)succinic acid to be equally estrogenic, on oral administration, to a comparable intravenous dose of estradiol benzoate.

•

Parathion Detection: New procedure for detection of parathion can spot as little as 9 micrograms. Ethyl alcohol is used to scrub a known volume of air containing the insecticide as a dust, mist, or vapor. Parathion in alcohol is then determined by ultraviolet spectrophotometry.

•

Atomic Export: Foreign institutions may now obtain 99 radioisotopic by-products of U.S. atomic furnaces. The new figure represents an increase of 73 different isotopes. The move is part of a program designed to further international development of non-military scientific research. Tritium—key to the hydrogen bomb—remains on the restricted list.

•

ACTH Labs: The University of California's School of Medicine will equip laboratories for ACTH and cortisone research as soon as it gets the green light from the NPA. New facilities will take part in a broad study of the effects of the hormones on arthritis and related diseases.

•

Dual Analysis: Difficult task of determining quinine in the presence of strychnine has been simplified by simultaneously measuring infra-red absorption. When the ratio of quinine to strychnine is greater than 50:1, a fluorometric method is used for quinine, infra-red for strychnine.

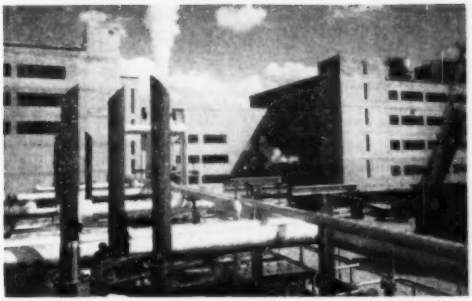
•

Nitrogen News: Nitrogen-packing is the latest food processing development. Elimination of oxygen keeps foods like potato chips, roasted nuts, dehydrated soups, and other packaged products, fresh for longer periods of time. Nitrogen, besides being harmless and tasteless, doesn't change the natural color and flavor.

•

Sugar Separation: Oak Ridge researchers have found that fructose, glucose, mannose and galactose, dissolved in weak sodium borate solution, are quantitatively adsorbed on strong-base anion exchangers.

Haul to West Over; Lever's New L.A. Plant Serves Area



SIX MAJOR BUILDINGS comprise the newly-opened $25 million Lever plant, viewed here from top of power house.

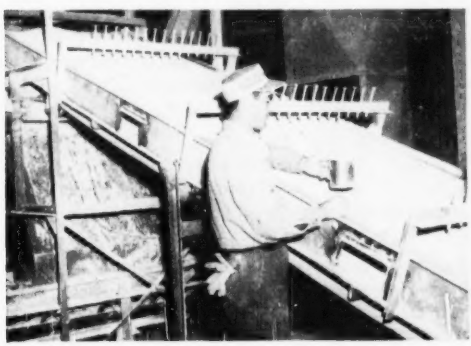
SOAP-MAKERS boil mix in soap kettle room. Each kettle yields about 170,000 lbs. of soap per boil, and the plant has 10 of them. Lever estimates that a single boil makes 165,000 cartons of Lux Flakes, or 580,000 cakes of Lux Toilet Soap.

The soap, synthetic detergent and shortening plant that Lever Bros. has just opened in Los Angeles (*CW, July 7*) will serve 11 Western states previously supplied from the company's units in the Mid-West and East.

Located on a 30-acre tract, the facilities are among the most modern of their kind anywhere. The group of six buildings that make up the plant covers about one-third of the site, the rest of which is landscaped. They are two main manufacturing buildings joined by an office and service wing; two detached processing units; and a steam-generating plant.

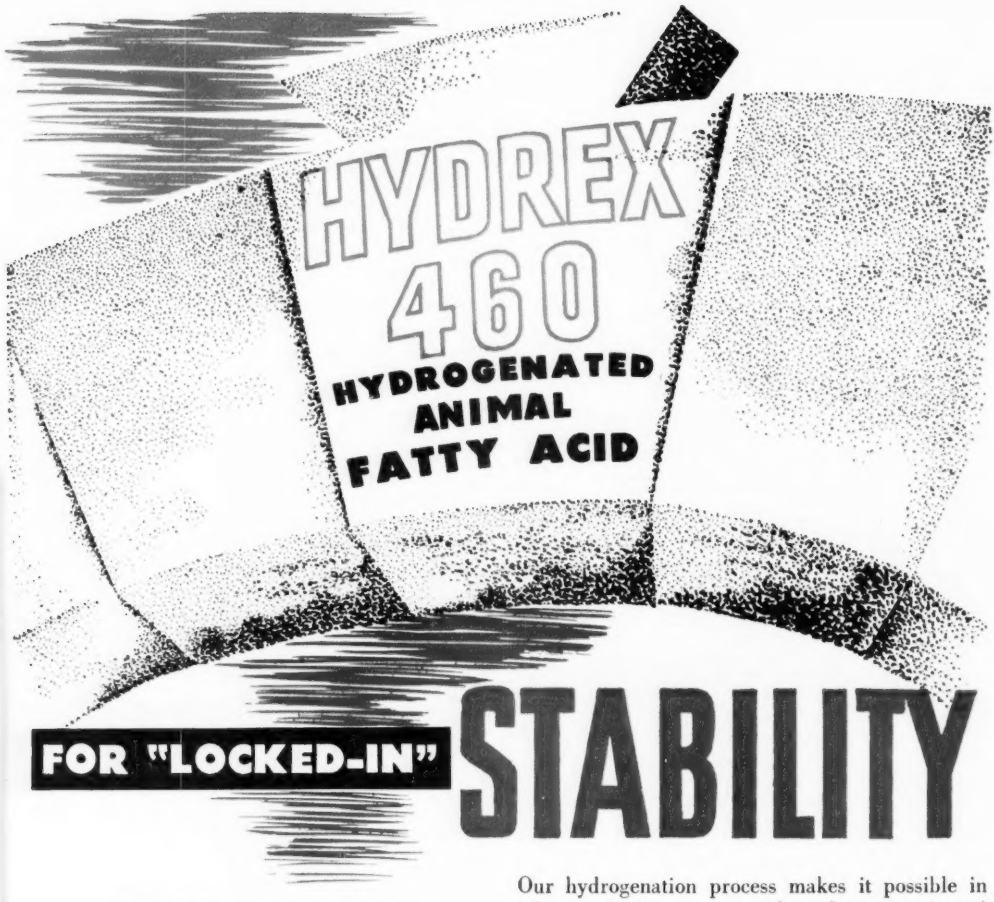
In keeping with construction trends characteristic of California, but thus far not common in the soap and edible fats business, much of the processing equipment is completely in the open. Other automatic equipment requiring closer attention by operators is protected only by roofs. Special equipment has been installed to eliminate smoke and odors, conserve water.

Eventually the new plant, now making a variety of Lever products, will manufacture the company's entire line of soaps, synthetic detergents and edible products. In full operation, the plant will employ 500 people, over 300 of whom are already at work. Finished products shipped will total about 135,000 tons a year.



OPERATOR takes test sample of Rinso granules for checking in research department's control laboratory.

PRODUCTS coming off packaging line will go to 11 Western states. Plant output will be 4,500 carloads a year.



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Bleach Trend: Strength in Numbers

Current expansion programs of big hypochlorite bleach manufacturers are taking the form of many new plants in scattered population centers of the country*. Objective: To beat rising freight rates (product is about 95% water), meet growing competition from local manufacturers.

Principal producers of the aqueous hypochlorite type of household disinfectant and bleach have discovered that there is little profit in shipping water around the country. Maintaining markets at great distances from manufacturing points has become increasingly difficult in the face of rising freight rates and stiffer competition from local manufacturers not operating under this impost. So such companies as Clorox Chemical Co. and Purex Corp., Ltd., are undertaking expansions that are dotting the country with new bleach plants in large cities.

Clorox, incorporated in 1928 but in business for years previously, was the first to sell the American housewife on the merits of sodium hypochlorite (approximately 5% aqueous solution) as a household standby for bleaching and cleaning. From its plant and home offices in Oakland, California, the company has grown to ten plants scattered from California to Florida and from Texas to New Jersey. Of the ten plants, four have been placed in operation within the past two years, and an eleventh is scheduled for Charlotte, N.C. The nine other units are located in Atlanta, Camden, Chicago, Cleveland, Houston, Jersey City, Los Angeles, Tampa and Kansas City.

Holding the Line: The decentralization program is an integral part of Clorox's attempt to keep the price of its product down. In spite of rising labor and raw material cost, a half gallon of Clorox has risen but 5¢ per case of 6 (from $1.45 to $1.50) in the past year. A larger increase has been avoided through increased volume, profit cutting and decentralization.

The company is unique in that Clorox is its only product, and its entire output is marketed under its own label. In 1946, Boon, a liquid household cleaner, was produced and marketed, but production was suspended when expected consumer demand failed to materialize. Whether any further expansion in this direction is planned is a closely guarded secret.

Returns from this one product, however, have been handsome. In the fiscal year 1949-1950, gross sales came to $21,622,000 of which $9,182,000 was gross profit, and $1,818,000 net profit. Figures for the company's first year of operation under the SEC Act of 1934 (gross profit, $1,784,000; net, $313,000) show that Clorox has come a long way in 15 years. With decentralization taking full effect in the first quarter of 1951, gross sales climbed to $6,047,000 for the quarter, and can be expected to rise still higher as more plants are in operation.

Capacities of the plants vary with location. The Oakland plant, the largest, uses five tons of chlorine per day (chlorine is bubbled through caustic solution with cooling to produce the bleach), originally produced in its own mercury-type Whiting cells, but now purchased. No statistics are available on the size of other plants, but the newest one, in North Kansas City, Mo. (*CIW, April 21*), cost $400,000, whereas the one to be built in Charlotte will cost $500,000.

Perhaps another incentive to its decentralization program came in June-October, 1949, when a strike against the Distributors Association of Northern California by the Warehousemans Union, Local 6, I.L.W.U. effectively halted shipments from the Clorox Oakland plant. During that period, the Bay Area was supplied from other plants, and Clorox customers were kept in the family.

Neighbor and Competitor: Clorox's major competitor is Purex Corp., Ltd., at the present leader in total sales west of the Mississippi. Organized in 1923, it began operations in a small Los Angeles plant and later moved to present home offices in Southgate, Calif. The company's first major expansion (in 1936) was to St. Louis (where it is currently spending $1 million dollars on a plant for synthetic detergents and household and industrial bleaches). Since then plants have been erected in Tacoma, Dallas, Atlanta, Memphis, New Orleans and San Leandro, the last four all commencing production during the summer of 1950.

Although Clorox and Purex are perhaps one-two in the household bleach field*, hundreds of local producers and chain stores--e.g. A & P with Bright Sail--have taken a considerable bite of the market. The importance of freight rates and the willingness of companies to compete with the big

* A new plant for Javex, Canada's leading bleach, has just opened in Winnipeg.

* In 1951, the *Consolidated Consumer Analysis* of 15 cooperating newspapers showed that of 15 markets surveyed, Clorox was first in 8, Purex first in 4 and Hilex first in 3 (Milwaukee, St. Paul and Duluth-Superior).

national names are underscored at hearing now being held by the North Carolina Utilities Commission on rates for intrastate hauling. A trucker has requested permission to haul Clorox at a cheaper rate than is currently allowed, and supporting him is Piedmont Chemical Co., also a manufacturer of hypochlorite bleach.

Piedmont has been using its own trucks, would prefer to patronize fleet operators if rates were low enough. And it favors the reduction even though the decision of its competitor, Clorox, to build in Charlotte may hinge on the favorable rates. Should these not be forthcoming, Clorox may shift to a site in South Carolina or Virginia.

Both Clorox and Purex will be more than satisfied to compete on an equal basis with independent local manufacturers. They hope to maintain and increase their national preeminence through continued expansion into areas where independence of freight rates and ample bottle sources make that possible.

Fungi Killer

What promises to be an effective remedy for athlete's foot, ringworm and other fungus infections has been developed by a government mycologist, and is having a limited sale at a number of drug stores.

The remedy, called AFO (Ames Fungicidal Ointment) was discovered by L. M. Ames, research mycologist and consultant at the Army's Engineer Research and Development Laboratories, Fort Belvoir, Va. Dr. Ames is the nation's authority on *Chaetomium* fungi, one of the destructive agents of cotton and other cellulose materials. He has studied and identified scores of new strains during the past dozen years, has a valuable collection of fungi. *(See cut of Dr. Ames, CW's Washington correspondent John Kent, and collection.)*

The Food and Drug Administration has given the green light to AFO ointment, an outgrowth of Ames' studies of fungus. The formula is his secret, but it does contain dihydroxydichlorodiphenyl methane. A two-ounce jar retails for $2.50.

For mild cases of athlete's foot, only a small amount of the salve is massaged into the skin until absorbed. In severe cases, medication is begun at the edges of the infection and applied sparingly to prevent possible reaction. Dr. Ames says that when large amounts of fungi are suddenly killed or weakened, toxic fluids from their cells ooze into the human tissue, caus-

CW'S KENT, ARMY'S AMES: From fungus studies, athlete's foot remedy.

ing a reaction. This toxic fungal material must be expelled by the body, so in severe cases, it may take several weeks before definite signs of recovery can be seen.

Some people may be allergic to AFO, and break out in the area of treatment. Treatment is then discontinued for a few days and resumed gradually.

•

To Each His Own: One industry advisory committee has told the Office of Price Stabilization it wants to be left under the General Ceiling Price Regulation for the present, while another favors a regulation tailored to its needs.

The committee of the Glass Container Industry (bottles, other glass containers) asked OPS to abandon a cost questionnaire that had been proposed as the first step toward drafting a specific regulation.

However, the Private Brand Cosmetic Manufacturers want a new regulation for their industry that would allow for rising costs of raw materials and labor in arriving at new ceiling prices. They also want simplified forms for applications for adjustment; object to requiring their customers to file statements that they won't pass on to consumers increases in manufacturers' ceilings. Also they oppose any provision requiring them to reveal names of prospective purchasers.

PICTURES IN THIS ISSUE

Cover (top) & p. 20—Superior Gas & Equip. Co.; Cover (bottom)—Lever Bros. Co.; p. 25—McGraw-Hill World News; p. 33—Reni Photos.

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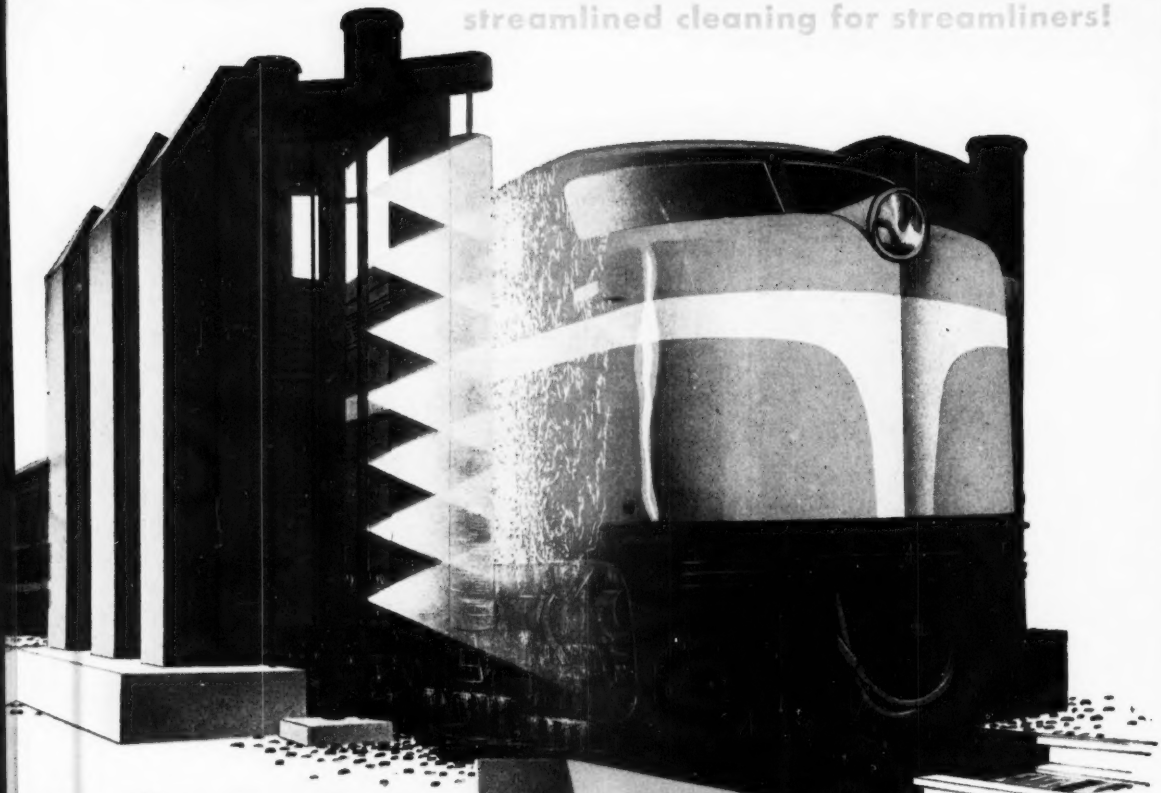

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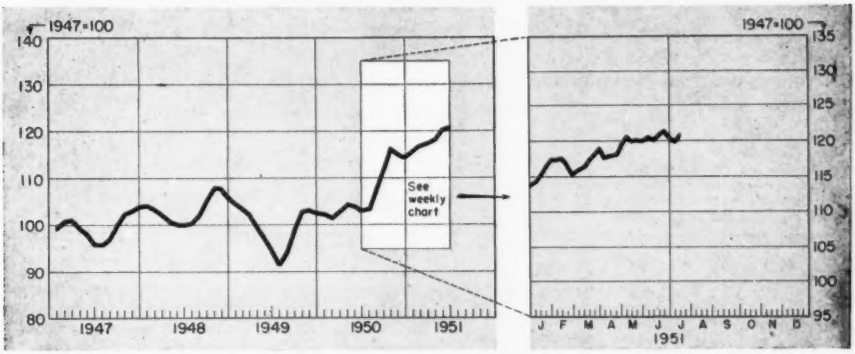
CHEMICAL MARKETS....



CHEMICAL INDUSTRIES OUTPUT INDEX — Basis: Total Man-Hours Worked in Selected Chemical Industries

Price control, price rollbacks, and the future role of the Office of Price Stabilization await the outcome of cease-fire negotiations in Korea. If a lasting armistice is reached, current opposition to OPS will stiffen. Either way, rollback powers will be drastically curbed, and enforcement will be hamstrung by a pruned budget.

While OPS authority wanes, new regulations emerge at an undiminished rate. Importers now have more time to file under CPR-31, or they can elect to remain under the general freeze order. Most importers, caught in the price squeeze last year, seem to prefer the new regulation, despite the complex reckoning entailed.

Some chemical manufacturers will also stay under the general price freeze instead of CPR-22, until OPS comes across with long-promised special pricing orders. Among the commodites on this docket: Anti-freeze; agricultural insecticides, herbicides, and fungicides; and all soaps, cleansers, and synthetic detergents not hitherto covered.

Chemical producers apparently face the future with unbounded confidence. Construction awards in the first half of 1951 totalled $679 million, five times the amount for the same period of 1950.

True, most of this output won't be available until 1952. But current production shows no tendency to abate. Reason: Manufacturers are counting on defense orders to sustain capacity operations.

However, inventories are climbing faster than sales. More demand will be needed to back up present production levels. Note of encouragement: Summer shutdowns are responsible for a good part of the sales decline. Most producers operate round-the-clock, but many of their customers shut down for vacations and inventory-taking.

The supply-demand sensitive chemical resale market feels the impact of a sales slump sooner and stronger. Each week, the market has been getting quieter, and trading is now mostly hand-to-mouth.

MARKET LETTER

WEEKLY BUSINESS INDICATORS	Latest Week	Preceding Week	Year Ago
Chemical Industries Output Index (1947 = 100)	119.7	119.5	104.5
Bituminous Coal Production (Daily Average, 1000 Tons)	1,410.0	1,912.0	319.0
Steel Ingot Production (Thousand Tons)	2,037.0	2,028.0	1,895.0
Wholesale Prices—Chemicals and Allied Products (1926 = 100)	137.5	137.3	115.7
Stock Price Index of 14 Chemical Companies (Standard & Poor's Corp)	238.7	234.1	165.2
Chemical Process Industries Construction Awards (Eng. News-Record)	$6,438,000	$13,240,000	$11,439,000

MONTHLY INDICATORS—FOREIGN TRADE (Million Dollars)	EXPORTS			IMPORTS		
	Latest Month	Preceding Month	Year Ago	Latest Month	Preceding Month	Year Ago
Chemicals, total	85.9	82.6	61.3	30.8	31.3	13.6
Coal Tar Products	7.0	6.8	3.1	2.6	5.4	1.9
Medicinals and Pharmaceuticals	26.6	25.1	17.5	1.5	1.0	0.4
Industrial Chemicals	15.2	13.7	8.1	13.4	12.5	2.5
Fertilizer and Fertilizer Materials	4.5	3.9	9.3	12.2	11.6	8.3
Vegetable Oils and Fats, Inedible	8.7	9.2	8.1	12.5	10.0	8.4

Under this check-rein, some still-scarce and much-wanted chemicals have hopped on the resale price toboggan.

Phenol is now quoted at 45¢ a pound, compared to 65¢ some eight weeks ago, while manufacturers still get around 19¢. Titanium dioxide was 65¢ a pound six weeks back, now can be had for 50¢, but producers still charge about 22¢.

Caustic soda's demand for export has tapered off a little more; solid is now quoted at 7½-8¢ and flake at 7-7½¢. These current resale prices are still double what the producers get. Lately, more South American importers have been trying to buy on open account instead of cash basis. But U.S. sellers are understandably chary about doing business on credit terms, in view of unfortunate experiences a few years ago.

Fluctuating price trends in the domestic market have another result: European suppliers of chemical imports are holding back on some chemicals in hope of getting higher prices elsewhere now, or here later. Example: Carbon tetrachloride's going price here is around 14¢, but Italian sources quote 15¢ a pound f.o.b. Genoa, or 17¢ delivered on this side.

A few chemicals still resist the downward price trend. Among these: Sodium cyanide at 29¢ a pound; phthalic anhydride at 60-70¢; and naphthalene (phthalic precursor) at 13¢ for imported 78° material.

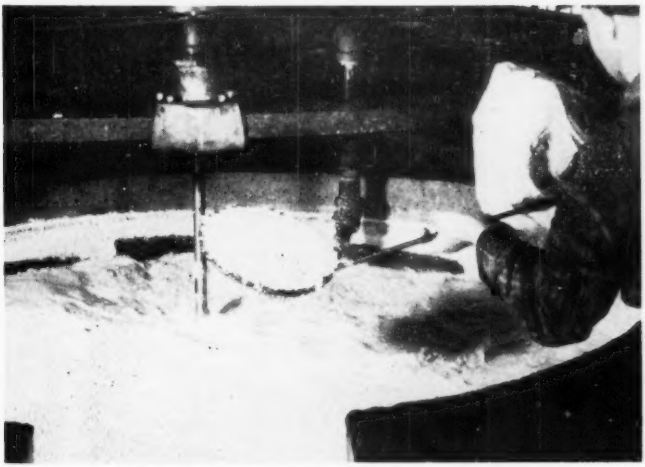
Phthalic anhydride users are concerned about a threat to U.S. naphthalene supplies. Steel producers are eying the greater use of coal tar for open hearth fuel, because of the relatively high cost of low-sulfur fuel oil. Reason: coal tar is cheaper and hotter.

Supplies of naval stores are at a near-record low for this time of the year. Nevertheless, crude gum prices f.o.b. Savannah dropped from $34 a barrel to $28 during the past week. Reason: seasonal slowdown in paint and soap.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending July 16, 1951

	Change	New Price		Change	New Price
UP					
Candelilla Wax, refined	$ .02	$ .83			
DOWN					
Carnauba Wax, No. 1	.01	1.27	Steric acid, double-pressed	$ .02	$ .16
Montan Wax, imported	.005	.15			

All prices per pound unless quantity is stated.



RUBBER: More chemicals are required for synthetic.

Rubber Chemicals: Enough

Higher consumption of synthetic rubber (GR-S) will boost requirements for rubber processing chemicals.

Trend to furnace blacks will lead to increased utilization of benzothiazyl accelerators.

The rubber industry is undergoing a revolution. In 1951 about 55% of the new general-purpose rubber supply—up from 38% in 1950—will be derived by synthesis of a butadiene-styrene copolymer (GR-S). As would be expected, such a violent swing will be accompanied by drastic changes in the large segment of the chemical industry that has grown up to supply rubber processing chemicals. But these changes will be confined principally to increased production of most of these materials—not a swing to different materials.

The rubber found in consumer goods is far from being a pure substance. About 60% is rubber; the remaining 40% is made up of a host of products. Sulfur is added for vulcanization; accelerators speed the vulcanization reaction; softening agents ease milling and speed conversion of the crude rubber into useful products; reinforcing pigments, mostly carbon black, increase its strength and resistance to abrasion; antioxidants decrease deterioration of the product when exposed to the oxygen of the air. Various other materials such as loading pigments are also added to the mix to make sure that the witches' brew which is known as rubber can be readily processed.

Based on Sulfur: Vulcanization is the basis of the rubber industry. And vulcanization, although it can be accomplished with other agents, is almost universally carried out by heating rubber with sulfur—over 60,000 long tons will be used this year. But when rubber and sulfur are used alone the reaction is too slow. Consequently accelerators were born—to speed up the vulcanization reaction. GR-S, however, requires about 40% more accelerator than natural rubber. Thus, although the same tonnage of new rubber will be used as in 1950, the increase in GR-S should be over-all requirements for accelerators from 55.4 million pounds in 1950 to over 60 million pounds this year. Expressed in cash, this means a $15 million-a-year market for 1951.

The accelerators used for synthetic rubber are the same as those used with natural rubber. However, the long-term trend to use of furnace blacks will increase consumption of low-scorch, delayed-action materials such as benzothiazyl disulfide and benzothiazyl sulfenamide. Other types, with the exception of the dithiocarbamates, will not enjoy any sizable increase. Increased usage of the relatively costly dithiocarbamates derives from an upsurge in specialty rubbers.

Without Oxygen: Reaction of vulcanized rubber with oxygen and ozone probably causes more deterioration of rubbers than anything else. Use of rubber antioxidants has grown to a $20 million-a-year business. Few data are available on production of the various types but phenyl β-naphthylamine and the reaction product of acetone and diphenylamine are reported to make up 75% of the total.

These two products, however, discolor in sunlight and stain many materials on contact. A recent trend has been towards non-staining and non-discoloring products, such as heptylated diphenylamine and various substituted phenols.

Controversy: The quantity of softeners required will be upped sharply. GR-S needs well over 50% more softener, which may be any one of several hundred products. But for the most part they are vegetable or mineral oils, tars, pitches or certain resinous materials. Resins of the coumarone-indene type work particularly well with GR-S.

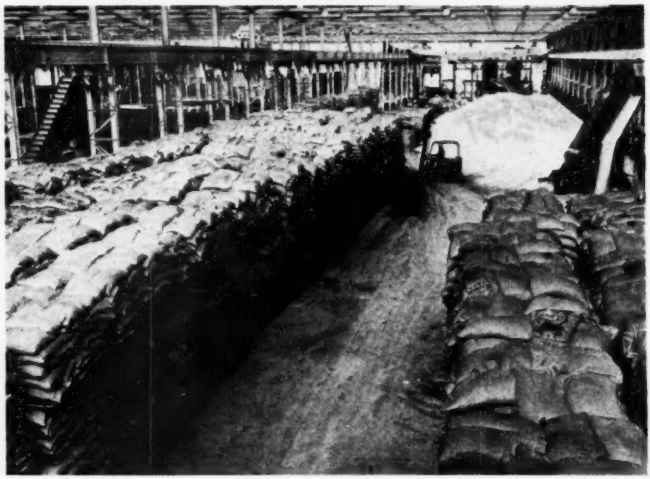
However, if the proposal advanced by General Tire should be carried out, the quantity will rise substantially. General purposes to prepare a tougher rubber polymer, add about 50% of a petroleum oil during the polymerization reaction. This will serve to extend now-short supplies of styrene and butadiene. Addition of a hydrocarbon oil is not new, but previously it was done in the milling operation. At present Polymer Corp., Sarnia, Ont., is the only company employing the process.

Other products to receive a sizable boost are the mercaptan modifiers used in the butadiene-styrene polymerization reaction—lauryl mercaptan for standard GR-S and a tertiary dodecyl mercaptan for "cold" rubber.

Accelerator Production
(millions of pounds)

	1948	1949	1950
Aldehyde Amines	0.9	0.8	0.5
Dithiocarbamates	1.2	0.7	2.4
Thiuram Sulfides	3.1	2.8	2.9
Guanidines	5.1	3.2	5.5
Mercaptobenzothiazole	12.2	11.5	14.9
Benzothiazyl Disulfide	9.8	10.3	15.0
Others	13.6	9.0	9.9
Thiazoles	35.6	30.8	39.8
Miscellaneous	1.9	3.0	4.3
Total	47.8	41.3	55.4

Source: U.S. Tariff Comm.



AMMONIUM SULFATE: Producers gain, mixers squeezed.

Fertilizer Spot Relief

There won't be much ammonium sulfate sold this year on contract for the next fertilizer season. The reason: most producers were caught in an economic wringer on last year's contracts. At the time that contracts were inked last July, ammonium sulfate prices were away down in the $32-37 a ton (in carloads at the producers plant) bracket. The familiar pattern of higher costs of materials and processing—without relief in selling price—put real pressure on producers.

By last November, shortages of sulfuric acid coupled with active fertilizer demand had boosted prices in the spot market to the $40-45 a ton level, which helped to keep the red ink away from the ledger. It is probable, of course, that producers would ultimately receive a higher ceiling price for contract sales, under the CPR-22 regulation of the Office of Price Stabilization. But it seemed like a simpler course to sell entirely in the spot market at the higher ceiling. With fertilizer demand heavy and getting heavier, chances of leaving any unsold by season's end is slim, indeed.

Who Makes: By far the bulk of ammonium sulfate is a by-product of coke-oven operation. In recent years, some 80-90% of all production has come from this source. In cokiag, the ammonia recovery is economically justified by the higher fuel value of the coke oven gas. Because of this most coke oven producers (including the larger steel producers) find themselves perforce in the business of making ammonium sulfate. Even though the business is small dollar-wise compared to their other operations, a million ton-a-year business, they feel, shouldn't lose money.

As an adjunct to the coke-oven business, by-product ammonium sulfate is made month in and month out, regardless of demand. But the makers of synthetic ammonium sulfate must depend on a suitable return on their efforts to get in or stay in. While prices hovered below the $40 a ton mark, synthetic production slackened. For instance, synthetic production in the spring this year has been only half what it was at the corresponding time of 1950. Now that the new fertilizer season has started, synthetic makers can expect to garner a higher price for their product in spot sales.

Who and Where: Generally, synthetic is more expensive to produce than by-product. But the differential is sometimes offset by closer location to the fertilizer market. In the West and Southwest part of the country, particularly, the synthetic producers are in a relatively favorable position. The lucrative fertilizer business of the East and Southeast is mostly preempted by the coke-oven product.

Sulfuric acid cost and availability is the other major factor that determines the economic well-being of the ammonium sulfate producer. The boost of 17% in sulfuric prices since last year has a powerful effect on ammonium sulfate costs, since the acid represents nearly three-fourths of the weight. The double problem in sulfuric acid has also led to another trend in some areas: greater use of ammonium nitrate or of ammonia itself.

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UNITED STATES STEEL

BOOKS.....

The Chemical Technology of Dyeing & Printing, Vol. II, by Louis Diserens, translated by Paul Wengraf and Herman P. Baumann. Reinhold Publishing Corp., New York, N.Y.; 600 pp., $14.

Translated and revised from the second German edition, this concluding volume, along with the first book on textile processing comprises a survey of the dyestuff groups. Like its predecessor, this text discusses in detail the chemistry of the reactions occuring on fibers, in addition to processes involved in their dyeing and printing. Groups covered include the basic dyestuffs, pigments, and aniline black, plus dyestuffs used for synthetic fibers. Bibliographic literature and patent references also appear.

Safety in the Chemical Laboratory, by H. A. Pieters and J. W. Creyghton. Academic Press, Inc., New York, N.Y.; 250 pp., $3.50.

This is a basic international safety manual for all those concerned with chemical operations. Outlined are the principles of careful and safe practice and accident prevention with sections on analytical procedures relating to toxic and hazardous substances, physiological effects of chemical substances, toxic gases and general safety tables.

Briefly Listed

WATER SUPPLY AND TREATMENT, seventh edition, by Charles P. Hoover, covering all the technical aspects of industrial and municipal water treatment, with revised sections on the disposal and reclamation of lime sludge, versenate method of determining water hardness, polystyrene base exchange, etc. Published by the National Lime Association, Washington 5, D.C. at $1.25 per copy.

MEETINGS..

Natl. Soybean Processors Assn., annual meeting, Edgewater Beach Hotel, Chicago, August 16.

Tanners' Council of Amer., annual meeting, Waldorf-Astoria Hotel, New York, N.Y., August 21-22.

Amer. Pharm. Assn., Statler Hotel, Buffalo, N.Y., August 26-31.

Summer Symposium, Nuclear Energy Development, annual meeting, Oak Ridge, August 27-September 7.

Amer. Chem. Soc., Diamond Jubilee Meeting, Statler Hotel, New York, N.Y., September 3-7.

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Products and literature in this issue are listed on these pages. There are three indexes. (1) Editorial items on new products, new equipment, new literature; (2) products advertised. (3) The index of advertisers is on the following page.

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Advertisements:—There is a page number on the coupon for each advertisement. Before the number, may appear, L, R, T, B (left, right, top, bottom), locating the ad on the page; small letters following (a,b,c) indicate additional products in the advertisement.

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EDITORIAL ITEMS

For more data, circle number on coupon

NEW PRODUCTS

Flaxedil 27A
TPN 28A

NEW EQUIPMENT

Automatic Titrator 21F
Explosion-Resistant Glass 21E
Hot Screens 21C
Pulsation Dampener 21B
Reformer 21A
Teflon-Coated Stirrer 21D

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EQUIPMENT

Dehumidifiers 44D
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Process Equipment 44F

GENERAL

Company Development 44H

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Chemical selection method, surface active agents, HLB system 9a

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Albumin tannate, medicinal T41e
Alkalis & Chlorine, bulletin 8 1d
Alkyl aryl sulphonates
AB-40, flakes or powder 10a
AB-concentrate, flakes or powder 10d
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DT powder 10c
E liquid 10b
KE liquid 10e
LW powder 10f
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Chlorine bleach, bulletin 14 1g
Chlorine, liquid, bulletin 7 1c
Chlorine, liquid, and bleach, bulletin 12 1f
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Nacconal 34
Sodium carboxy methyl cellulose 3
Dichloran T41f
Digitoxin T41b
Diphenylacetic acid 6
Emulsifiers, G-2081 9c
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Fatty acids, animal, hydrogenated, Hydrex 460 30
For glass producers T33
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Iron oxide pigments 19
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READER SERVICE COUPON

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NAME _____

POSITION _____

COMPANY _____

ADDRESS _____

CITY & STATE _____

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Expires October 21, 1951

BOOKLETS

Chemicals

Polyvinyl Resin

12-p. bulletin on "Geon Resin 404," a high molecular weight resin which can be processed without plasticizers in conventional plastics equipment. Outlined are principal applications, physical properties and processing methods with graphs on tensile and flexural strengths, modulus of elasticity, heat distortion temperatures, chemical resistance, etc. B. F. Goodrich Chemical Co.

Soya Copolymer

Technical bulletin describing "Admerol 301," a medium to long soya copolymer as an enamel vehicle especially recommended for use in white gloss enamels, flat enamels, exterior enamels and clear varnish blends; included here are compatibility data, film properties and various enamel formulas. Archer-Daniels-Midland Co.

Protective Agent

Report giving information on Witco 8% copper naphthenate, a fungicide and preservative for cellulosic materials affording protection against fungus, mold, mildew and marine parasites, with no harmful effect on wood, metal or fabric. Witco Chemical Co.

Equipment

Dehumidifiers

4-p. bulletin describing dynamic dehumidifiers for air in instruments, for either fully automatic or semi-automatic operation; operating data and prices are given as well as tables noting equipment used for both the automatic and semi-automatic models. Industrol Corp.

Mercury Cleaning

4-p. bulletin reviewing the principles of operation, usage instructions and the various sizes and capacities of the firm's mercury oxifiers and gold adhesion filters; the oxifier acts to reduce base metals to oxide precipitates while the filter removes these precipitates plus floating impurities. Bethlehem Apparatus Co.

Process Equipment

68-p. catalog covering process equipment for the pulp and paper, chemical, food processing, mining, construction and petroleum industries—all grouped into categories of corrosion, abrasion, and heat resistance; the chemical composition and mechanical properties of the firm's alloys are charted, and various types of corrosion problems are discussed with respect to suitable alloys used to combat them. Electric Steel Foundry Co.

Large Pumps

24-p. booklet concerned with large pumps and the application of a-c motors to them; in addition to a lead article entitled, "How Detroit Pumps Away Storm Water," there are illustrated discussions of such topics as the applications of large a-c motors to centrifugal pumps, cooling water pumping in the petroleum industry and the use of the variable speed magnetic drive on pumping applications. Electric Machinery Mfg. Co.

General

Company Development

48-p. booklet entitled, "Reynolds Aluminum and the Company That Makes It," reviews the historical background and growth of the company as a producer of aluminum; besides discussing the production facilities, products and fields served by the firm, the booklet contains a special section showing several of the multiple military applications for aluminum. Reynolds Metals Co.

*Production Facilities

18-p. illustrated report published by manufacturers of line of steam generating equipment, flowable materials conveyors, and large iron, steel and sheet metal units to specifications. Described are company's production facilities and equipment for handling war contracts and subcontracts as well as additional information on management, history and products. Hapman-Dutton Co.

* Request must be made to company on business letterhead.

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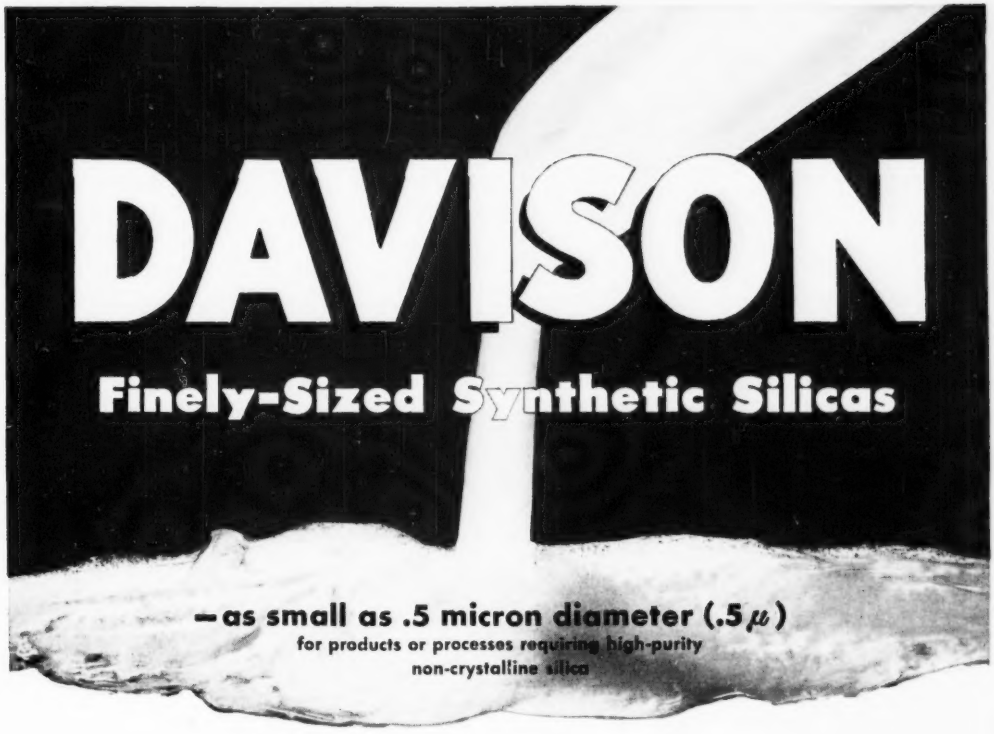

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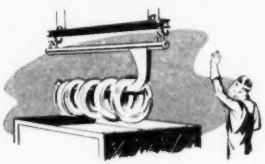

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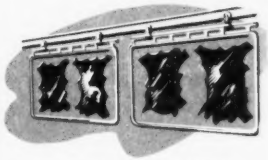

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